STRUCTURED ANALYSIS
LSA TASK 301
FUNCTIONAL REQUIREMENTS IDENTIFICATION

Subtask 301.2.4.2
Reliability Centered Maintenance (RCM)

APJ 966-208

APJ

MILITARY & SCIENTIFIC RESEARCH

AMERICAN POWER JET CO. RIDGEFIELD N.J.

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This report is one of a series presenting the Structured Analysis for the Logistic Support Analysis (LSA) Task and the Intergrated Logistic Support (ILS) Element. The structured Analysis for the LSA Task and ILS Element is included in this report, "Reliability Centered Maintenance (RCM)", with the corresponding description of the processes, data flows, data stores, and external entities involved on each data flow diagram. An overview of the LSA Task analysis procedures and a guide to the overall RCM process, as well as the Structured Analysis place in the overall systems development process, and the Structured Systems Analysis fundamentals brief working description.

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APJ 966-208

STRUCTURED ANALYSIS
LSA TASK 301
FUNCTIONAL REQUIREMENTS IDENTIFICATION

SUBTASK 301.2.4.2
RELIABILITY CENTERED MAINTENANCE (RCM)

under

CONTRACT DAAA21-86-D-0025

for

HQ US AMCCOM
INTEGRATED LOGISTIC SUPPORT OFFICE
AMSMC-LSP
ROCK ISLAND, IL

AMERICAN POWER JET COMPANY

RIDGEFIELD, NJ — FALLS CHURCH, VA

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FOREWORD

APJ, under contract to HQs, AMCCOM, has initiated the automation of the LSA Tasks (MIL-STD-1388-1) and the assessment of the ILS elements (AR 700-127). A major goal is to unify military and contractor approach to the performance of ILS and LSA.

Detailed to meet all requirements of ILS and LSA, the automated process will continue to provide the flexibility in selecting tasks and elements to be addressed at each life cycle stage. A major advantage of this approach is to insure that application of each task element is consistent with prescribed Army policies and procedures.

This report is one of a series presenting the Structured Analysis of each LSA Task and ILS Element. Structured Analysis comprises a description of the process being automated in terms which facilitate system design and subsequent programming. It is increasingly the preferred approach in both industry and Government.

This Technical Note reports on the Data Flow Diagrams (DFDs) of LSA Task 301.2.4.2, "Reliability Centered Maintenance (RCM)", and provides definitions of the processes, data flows, data stores, and external entities involved on each DFD (Annexes A and B). The report provides an overview of the LSA Task analysis procedures and a guide to the overall RCM process.

To view this work in context, this report also presents a brief overview of Structured Analysis and its place in the overall systems development process. Additionally, Annex C provides a brief working description of the Structured Systems Analysis fundamentals. The overview and certain portions of the introductory text are repeated verbatim in every report in this series so that each one can stand alone.

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INTRODUCTION

PURPOSE

The purpose of this report series is to present the results of the APJ efforts under Contract DAAA21-86-D-0025 for coordination with the AMCCOM Program Manager prior to in-depth structured design of ILS and LSA functions and processes. "Reliability Centered Maintenance (RCM)" (Subtask 301.2.4.2) is addressed in this report.

BACKGROUND

The Department of the Army has a requirement for management control over contractor and Government agency response to the requirements of AR 700-127, "Integrated Logistic Support", and MIL-STD-1388-1, "Logistic Support Analysis". HQs AMCCOM has initiated action to structure each of the LSA tasks, the assessment of each ILS element, the form of the results, and the detailed processes to insure consistency with current Army policies, procedures, and techniques.

This approach (undertaken by AMCCOM and APJ) will insure uniformity in efforts and products, reproducibility of analyses, and a well-defined structure which can be coordinated among all participants in the logistic process to arrive at common understanding and procedures.

SCOPE

This report summarizes the results of the Structured Analysis of the Reliability Centered Analysis (RCM), LSA Subtask 301.2.4.2 and presents the associated Data Flow Diagrams (DFDs) developed from the Structured Analysis. The portions of the Data Dictionary relating to labels, names, descriptions, processes, data flows, data stores, and external entities are included in their present degree of completeness. (The Data Dictionary is a "living document" that evolves through the analysis and design process).

To place this work in context, this report presents a brief overview of Structured Analysis and its place in the overall systems design process to assist the reader who may not be fully briefed on the symbols and conventions used. It is supported by Annex C, which defines each element in structured analysis, and a glossary.

LSA SUBTASK 301.2.4.2 DESCRIPTION

LSA Subtask 301.2.4.2 concerns the development of a detailed Maintenance Plan for a specific system or equipment using the Reliability Centered Maintenance (RCM) concept developed by the U.S. Airlines Maintenance Steering Group #1 (MSG-1).

This concept uses the Failure Mode, Effects and Criticality Analysis (FMECA) to develop a scheduled Maintenance Plan and addresses:

- Maintenance intervals for preventive maintenance checks and services (PMCS)
- Information relative to overhaul, age exploration, economic analysis and redesign.

The RCM logic provides a rational approach to task classification by assessing the functional failures relative to consequence of failure, categorized by Safety Hazard Severity Codes:

1. Catastrophic
2. Critical
3. Marginal
4. Minor.

Thus, scheduled maintenance tasks should generally be performed on Category 1 and 2 items, and Category 3 and 4 items should '(subject to economic consideration) be permitted to operate to failure, and corrective maintenance used to restore the system (unless scheduled maintenance would reduce life cycle costs).

The information base needed for the RCM logic is available only after the FMECA has been completed. The logic is applied to each reparable item in the system/equipment. When the components have been analyzed, an overall system/equipment analysis is required to arrive at the proposed system Maintenance Plan.

This analysis merges the individual component decisions into a system Maintenance Plan by optimizing the scheduled maintenance frequency and the sequence of individual scheduled tasks.

The decisions on disposition of each failure mode considered are:

A. Economics dictate that scheduled (preventive) maintenance is the only possible decision
B. Scheduled (preventive) maintenance
C. Unscheduled (corrective) maintenance
D. Age exploration
E. Redesign.

To a large degree, these failure disposition decisions are based on the predictability of the failure mode, the frequency of the failure, and the failure consequence, such as:

1. Safety
2. Operational capabilities
3. Economics
4. Hidden failures, which may result in critical multiple failures.

The RCM task definitions from MIL-STD 1388-1A are included as Annex A.

APPROACH

The APJ approach to structured design of the LSA is:

1. Scope the process defined in MIL-STD-1388-1A in the context of the other LSA tasks.

2. Review the guidance provided in AMC PAM 700-11, "Logistics Support Analysis Review Team Guide".

3. Review the applicable Data Item Descriptions (DIDs) from the Acquisition Management Systems and Data Requirements Control List (AMSDL) published by the Department of Defense.

4. Review all source documents referenced in the AMSDL as applicable to the referenced DIDs of interest.

5. Apply staff experience in logistics support analysis to assure that the intent of the task has been addressed.

6. Validate results in discussions with Army activities and personnel directly involved in the applicable or related LSA tasks.

Structured Analysis and preparation of Data Flow Diagrams (DFDs) was further assisted by the application of Structured Analysis software. Licensed by Index Technology Corporation, Excelerator provides for automated tracking of names, labels, descriptions, multiple levels of detail in the data flow diagrams, and industry standards in symbols and diagramming practices.

Following completion of the draft DFDs, the diagrams and data dictionary were made available to working Army logisticians currently (or recently) directly involved in the application of the same LSA tasks in current Army development programs. Comments were solicited relative to the logic of the processes described, the scope and details of the indicated approaches, and the outputs implied by the LSA task requirements.

Draft products were well received by the external reviewers, and requests have been made for copies of the DFDs for in-house use in organizing ILS and LSA efforts. Comment was also received that the DFDs will be a useful training tool for apprentice logisticians, since they provide an overall picture of the total task and a uniform approach to its fulfillment.

STRUCTURED ANALYSIS AND DESIGN

Structured Analysis and Structured Systems Design evolved from the need to define and demonstrate the underlying logical functions and requirements of large systems. The concept of Structured Analysis involves building a logical (non-physical) model of a system, using graphic techniques which enable users, analysts, and designers to get a clear and common picture of the system and how its parts fit together to meet the user's needs. It is followed by structured design, and then by programming, and test and validation. Annex C provides a brief description and guide to the fundamentals of a Structured Systems Analysis.

The Structured Analysis and Structured Systems Design process, sometimes referred to as "Structured Systems Analysis and Design (SSAD)", is well documented and widely utilized in Government and industry.

As stated in "The Practical Guide to Structured Systems Design" (Meilir Page-Jones, Prentice-Hall, Englewood Cliffs, NJ, 1980):

..."Structured Design is disciplined approach to computer system design, an activity that in the past has been notoriously haphazard and fraught with problems.

"1. Structured Design allows the form of the problem to guide the form of the solution.

"2. Structured Design seeks to conquer the complexity of large systems by means of partitioning the system into "black boxes," and by organizing the black boxes into hierarchies suitable for computer implementation.

"3. Structured Design uses tools, especially graphic ones, to render systems readily understandable.

"4. Structured Design offers a set of strategies for developing a design solution from a well defined statement of a problem.

"5. Structured Design offers a set of criteria for evaluating the quality of a given design solution with respect to the problem to be solved.

"Structured Design produces systems that are easy to understand, reliable, flexible, long lasting, smoothly developed, and efficient to operate - and that WORK...."

The organization of Structured Analysis and its relationship to Structured System Design is shown on Figure 1.

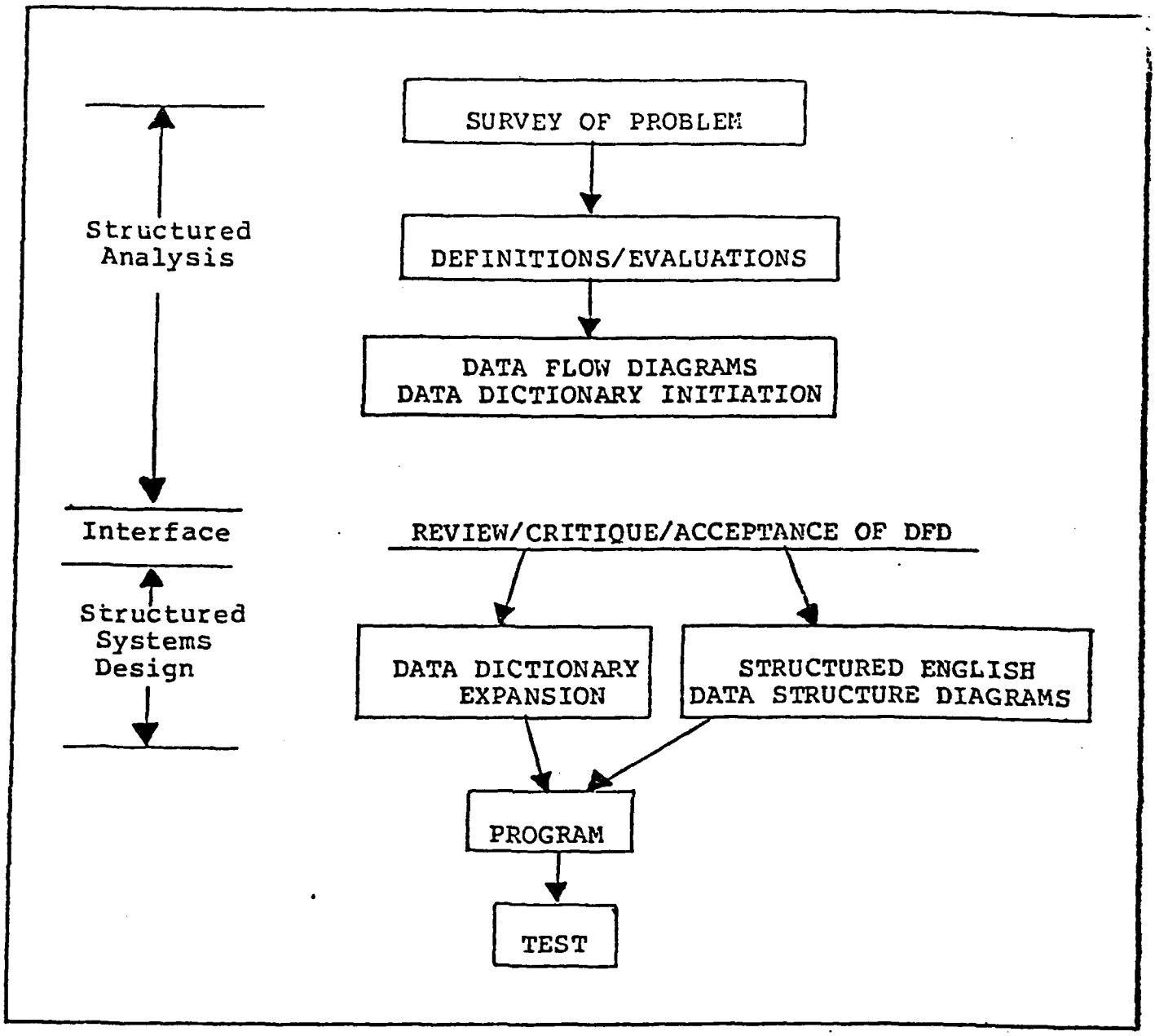


Figure 1. Structured Analysis and Structured Systems Design Organization

LSA SUBTASK 301.2.4.2 - DATA FLOW DIAGRAMS

The Data Flow Diagram is a tool that shows flow of data, i.e., data flows from sources and is processed by activities to produce intermediate or final products.

The DFD provides a useful and meaningful partitioning of a system from the viewpoint of identification and separation of all functions, actions, or processes so that each can be introduced, changed, added, or deleted with minimal disruption of the overall program, i.e., it emphasizes the underlying concept of modularity and identifiable transformations of data into actionable products.

A series of seven (7) DFDs have been developed to structure the RCM LSA subtasks:

1.	301.2.4.2	RCM Overview
2.	301.2.4.2.1A	Piece/Part Criticality Assessment
3.	301.2.4.2.2A	Economic Assessment - Scheduled vs Unscheduled
4.	301.2.4.2.3A	Impending Failure Detection Assessment
5.	301.2.4.2.3A1B	Impending Failure Detection Analysis
6.	301.2.4.2.4A	Undetected Impending Failure Analysis
7.	301.2.4.2.5A	Detectable Failure Assessment

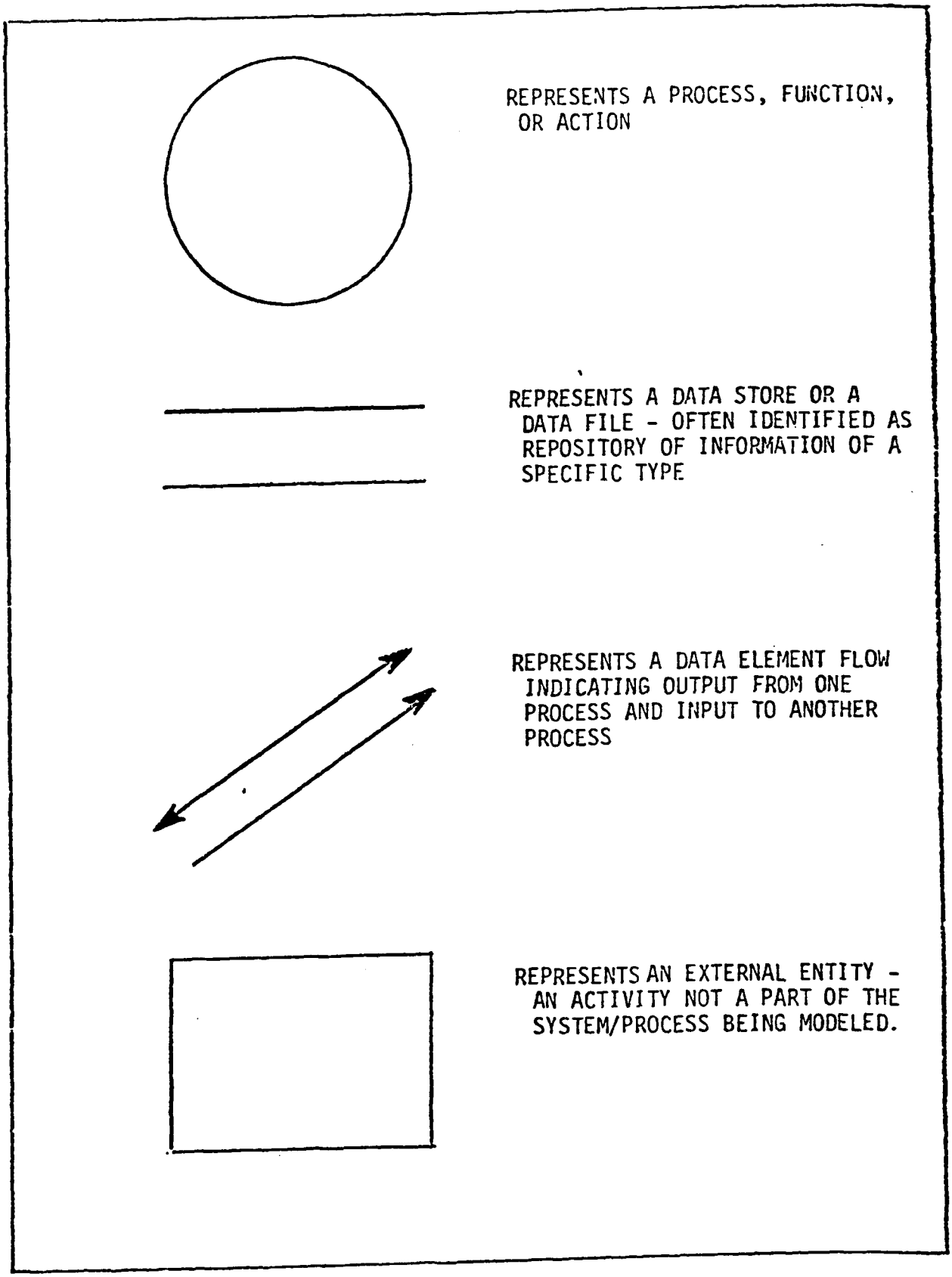


Figure 2. STANDARD DFD SYMBOL DEFINITIONS

Each DFD is keyed to the specific task (LSA, in this case) through the identification number assigned in the lower right hand box. For example, the DFD, "301.1.4.2", refers to the paragraph in MIL-STD-1388-1A which describes task. One of the processes (bubbles) on the top level diagram (301.2.4.2.3) is expanded and identified as "201.2.4.2.3A", a second level of 301.2.4.2 (Alpha "A" indicates the second level).

In turn, DFD 301.2.4.2.3A has a process (bubble) 301.2.4.2.3A1, "Impending Failure Detection Analysis", which is further exploded on DFD 301.4.2.3A1B, a third level explosion of the basic DFD 301.2.4.2.3A (Alpha "B" indicates the third level explosion).

Thus, the example above reads as follows:

Top Level.....LSA DFD 301.2.4.2

First Indenture.....LSA DFD 301.2.4.2.3A

Second Indenture.....LSA DFD 301.2.4.2.3A1B

Four standard symbols are used in the DFD drawing (see Figure 2).

A copy of each DFD is presented in Annex B, accompanied by the Data Dictionary process elements. Each entry made in the DFDs has a corresponding entry in the Data Dictionary, immediately following each of the DFDs.

This Technical Note presents only those Data Dictionary entries necessary for the coordination of the overall concept and details of the processes. To facilitate review of the diagrams, data flow identifications, process, and data store descriptions are provided. As noted above, they will continue to evolve and be expanded in the System Design phase.

As the DFDs progress through Structured System Design, the Data Dictionary will continue to be expanded and completed. Since they are working documents rather than final submissions, only minimum effort has been devoted to editorial niceties, e.g., spelling, typography, etc.

ANNEX A:

LSA SUBTASK 301.2.4.2 - RELIABILITY CENTERED MAINTENANCE (RCM)

ANNEX A
LSA TASK 301 - FUNCTIONAL REQUIREMENTS IDENTIFICATION 1/

301.1 PURPOSE: To identify the operations and support functions that must be performed for each system/equipment alternative under consideration, and then identify the tasks required to operate and maintain the new system and equipment in its intended environment.

301.2 TASK DESCRIPTION:

301.2.4.2 - Preventive maintenance task requirements shall be identified by conducting a Reliability Centered Maintenance (RCM) analysis in accordance with the detailed guidelines provided by the requiring authority. The RCM analysis shall be based on the FMECA data and documented in the LSAR or equivalent format approved by the requiring activity.

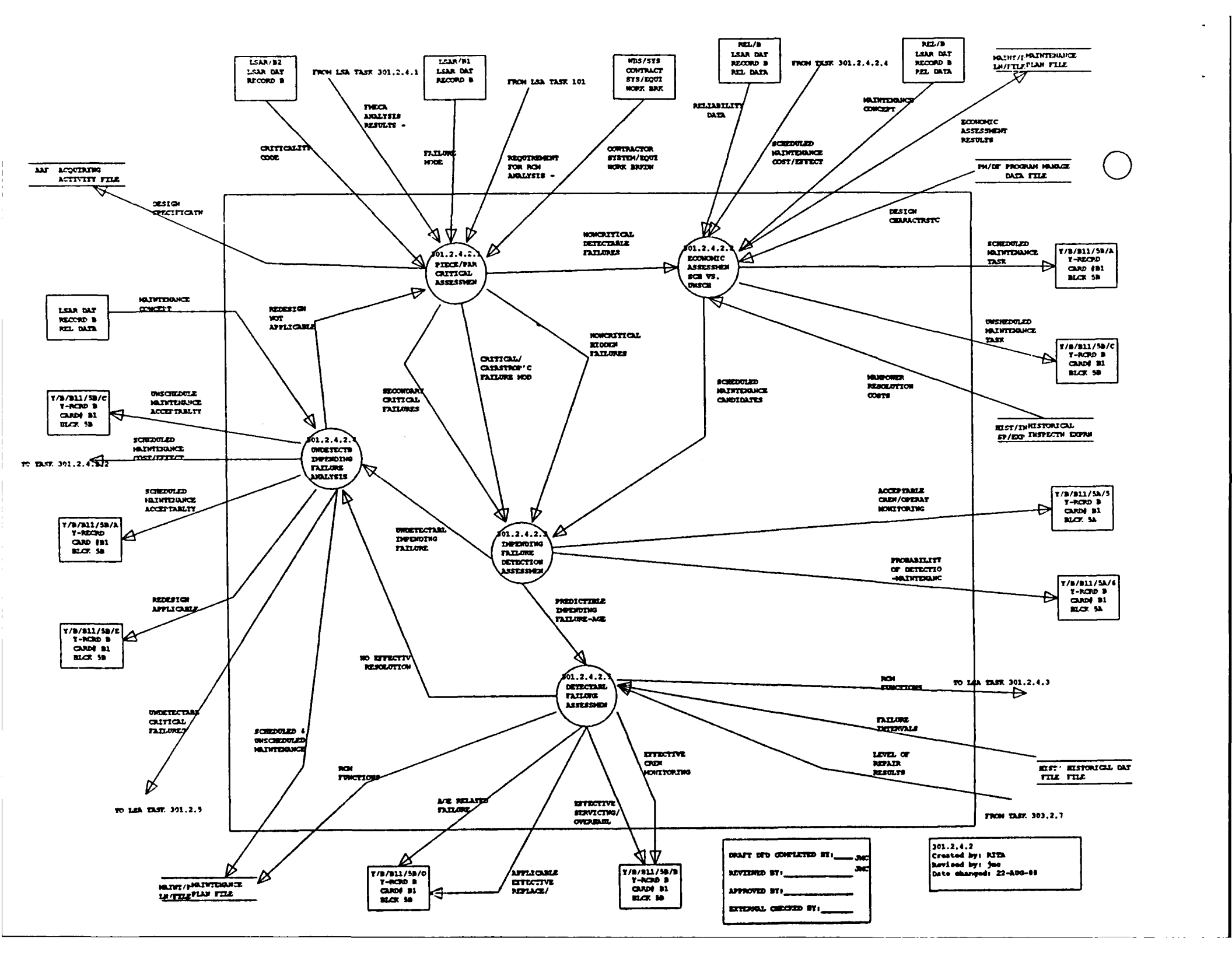
1/ Abstracted verbatim from MIL-STD-1388-1A, April 11, 1983, Page 31.

ANNEX B:

SUBTASK 301.2.4.2 - DATA FLOW DIAGRAMS AND DATA DICTIONARY

301.2.4.2

RCM OVERVIEW


LSAR/B2 LSAR DAT RECORD B
FROM LSA TASK 301.2.4.1
LSAR/B1 LSAR DAT RECORD B
FROM LSA TASK 101
WDS/SYS CONTRACT SYS/EQUI WORK BRK
REL/B LSAR DAT RECORD B REL DATA
FROM TASK 301.2.4.2.4
REL/B LSAR DAT RECORD B REL DATA
MAINT/I MAINTENANCE LN/ITLI PLAN FILE
FMECA ANALYSIS RESULTS -
CRITICALITY CODE
FAILURE MODE
REQUIREMENT FOR RCM ANALYSIS -
CONTRACTOR SYSTEM/EQUI WORK BRKDN
RELIABILITY DATA
MAINTENANCE CONCEPT
ECONOMIC ASSESSMENT RESULTS
SCHEDULED MAINTENANCE COST/EFFECT
AAF ACQUIRING ACTIVITY FILE
PM/DF PROGRAM MANAGE DATA FILE
DESIGN SPECIFICATN
DESIGN CHARACTRSTC
301.2.4.2.1 PIECE/PAR CRITICAL ASSESSMEN
NONCRITICAL DETECTABLE FAILURES
301.2.4.2.2 ECONOMIC ASSESSMEN RCM VS. UNSCH
SCHEDULED MAINTENANCE TASK
Y/B/B11/5B/A Y-RCRD CARD #B1 BLCK 5B
LSAR DAT RECORD B REL DATA
MAINTENANCE CONCEPT
REDESIGN NOT APPLICABLE
NONCRITICAL HIDDEN FAILURES
UNSCHEDULED MAINTENANCE TASK
Y/B/B11/5B/C Y-RCRD B CARD# B1 BLCK 5B
CRITICAL/ CATASTROP'C FAILURE MOD
SECONDARY CRITICAL FAILURES
SCHEDULED MAINTENANCE CANDIDATES
MANPOWER RESOLUTION COSTS
Y/B/B11/5B/C Y-RCRD B CARD# B1 BLCK 5B
UNSCHEDULE MAINTENANCE ACCEPTABLTY
HIST/IN HISTORICAL SP/EXP INSPECTN EXPRN
301.2.4.2.3 UNDETECTB IMPENDING FAILURE ANALYSIS
SCHEDULED MAINTENANCE COST/EFFECT
TO TASK 301.2.4.3.2
SCHEDULED MAINTENANCE ACCEPTABLTY
ACCEPTABLE CREW/OPERAT MONITORING
Y/B/B11/5A/5 Y-RCRD B CARD# B1 BLCK 5A
Y/B/B11/5B/A Y-RCRD CARD #B1 BLCK 5B
UNDETECTABL IMPENDING FAILURE
301.2.4.2.4 IMPENDING FAILURE DETECTION ASSESSMEN
PROBABILITY OF DETECTIO -MAINTENANC
Y/B/B11/5A/6 Y-RCRD B CARD# B1 BLCK 5A
REDESIGN APPLICABLE
PREDICTIBLE IMPENDING FAILURE-AGE
Y/B/B11/5B/E Y-RCRD B CARD# B1 BLCK 5B
NO EFFECTIV RESOLUTION
301.2.4.2.5 DETECTABL FAILURE ASSESSMEN
RCM FUNCTIONS
TO LSA TASK 301.2.4.3
UNDETECTABL CRITICAL FAILURES
SCHEDULED & UNSCHEDULED MAINTENANCE
FAILURE INTERVALS
EFFECTIVE CREW MONITORING
LEVEL OF REPAIR RESULTS
HIST' HISTORICAL DAT FILE FILE
RCM FUNCTIONS
TO LSA TASK 301.2.5
A/E RELATED FAILURE
EFFECTIVE SERVICING/ OVERHAUL
FROM TASK 303.2.7
MAINT/P MAINTENANCE LN/TILE PLAN FILE
Y/B/B11/5B/O Y-RCRD B CARD# B1 BLCK 5B
APPLICABLE EFFECTIVE REPLACE/
Y/B/B11/5B/B Y-RCRD B CARD# B1 BLCK 5B
DRAFT DFD COMPLETED BY: ____ JMC
REVIEWED BY: _____ JMC
APPROVED BY: _____
EXTERNAL CHECKED BY: _____
301.2.4.2
Created by: RITA
Revised by: jmc
Date changed: 22-AUG-88

Name	Label	Description
301.2.4.2.1	PIECE/PART CRITICAL ASSESSMENT	USING DATA FROM THE FAILURE MODE EFFECTS AND CRITICALITY ANALYSIS, AND THE WORK BREAKDOWN STRUCTURE, ASSESS THE CRITICALITY OF EACH COMPONENT IN TERMS OF MISSION OR OPERATING SAFETY. EACH POTENTIAL FAILURE IS ASSESSED AND IS ASSIGNED TO ONE OF FOUR BASIC CATEGORIES-- 1 CATASTROPHIC 2. CRITICAL. 3. MARGINAL. 4. MINOR. THESE FOUR CATEGORIES ARE IDENTIFIED AS SAFETY HAZARD SEVERITY CODES. THIS ELIMINATES FURTHER MAINTENANCE REQUIREMENTS ASSESSMENTS AND EXPEDITES THE ANALYSIS BY ELIMINATING THOSE FAILURES AND ITEMS FROM THE ANALYTICAL PROCEDURE WHOSE FAILURES HAVE NO SIGNIFICANT CONSEQUENCE. SCHEDULED MAINTENANCE TASKS SHOULD BE PERFORMED FOR NON-CRITICAL (CATEGORY 3 AND 4) COMPONENTS/PARTS ONLY WHEN PERFORMANCE OF THE SCHEDULED TASK WILL REDUCE THE LIFE-CYCLE COST OF THE EQUIPMENT/ SYSTEM. SOURCE OF DATA: - MIL-STD 1629A (FAILURE MODE, EFFECTS AND CRITICALITY ANALYSIS). - LSAR RECORD/B2 (CRITICALITY CODE). - LSAR RECORD/B1 (FAILURE MODE). - TASK 101 (CONTRACTUAL REQUIREMENTS FOR RCM ANALYSIS) - CONTRACTOR (SYSTEM/EQUIPMENT WORK BREAKDOWN STRUCTURE). - INQUIRING ACTIVITY FILE (DESIGN SPECIFICATIONS)
301.2.4.2.2	ECONOMIC ASSESSMENT SCH VS. UNSCH	USE ECONOMIC CONSIDERATIONS AS A BASIS FOR DETERMINING IF THE POTENTIAL FAILURE UNDER ANALYSIS OR ITS EFFECTS CAN BE TOLERATED AND THE EFFECTS OF THE FAILURE BE WEIGHED AGAINST THE POTENTIAL COST OF REDESIGN. IF THE FAILURE OR ITS EFFECTS CAN BE TOLERATED, THEN ECONOMICS MUST BE CONSIDERED WHEN DETERMINING THE TYPE MAINTENANCE THAT WOULD PREVENT MISSION DEGRADATION OR SAFETY HAZARDS. SOURCE OF DATA: - LSAR RECORD/B (RELIABILITY DATA) - LSAR RECORD/B (MAINTENANCE CONCEPT) - PROGRAM MANAGER FILE (DESIGN CHARACTERISTICS). - HISTORICAL/INSPECTION FILE (MANPOWER RESOLUTION COST) - 301.2.4.2.1(NONCRITICAL DETECTABLE FAILURES)
301.2.4.2.3	IMPENDING FAILURE DETECTION ASSESSMENT	IDENTIFY THOSE POTENTIAL CRITICAL FAILURE MODES WHICH CAN BE DETECTED BY ROUTINE OPERATOR/CREW MONITORING WITH SUFFICIENT LEAD TIME TO PREVENT A MISSIOM ABORT OR SAFETY HAZARD. IF THERE IS A HIGH PROBABILITY THAT THE POTENTIAL FAILURE MODE UNDER ANALYSIS CAN BE DETECTED WITH SUFFICIENT LEAD TIME BEFORE IT WILL ACTUALLY OCCUR, TO PREVENT A MISSION ABORT OR INCURRENCE OF A SAFETY HAZARD, THEN A DETERMINATION MUST BE MADE AS TO WHAT MAINTENANCE TASKS ARE REQUIRED TO PREVENT THIS FAILURE. SOURCE OF DATA: - 301.2.4.2.1 (SECONDARY CRITICAL FAILURES.). (CRITICAL/CATASTROPHIC FAILURE MODE-SHSC 1,2). (NONCRITICAL HIDDEN FAILURES). - 301.2.4.2.2 (SCHEDULED MAINTENANCE CANDIDATES).

Name	Label	Description
301.2.4.2.4	UNDETECTBL IMPENDING FAILURE ANALYSIS	IDENTIFY THOSE CRITICAL FAILURE MODES WHICH CANNOT BE DETECTED THROUGH ROUTINE OPERATOR/CREW MONITORING WITH SUFFICIENT LEAD TIME TO PREVENT A MISSION ABORT OR CREATE A SAFETY HAZARD. THESE UNDETECTABLE ITEMS WILL REQUIRE FURTHER ANALYSIS TO DETERMINE IF MAINTENANCE TASKS CAN OVERCOME THE PROBABILITY OF FAILURE OR IF REDESIGN IS REQUIRED. SOURCE OF DATA: - 301.2.4.2.3 (UNDETECTABLE IMPENDING FAILURES). - 301.2.4.2.5 (NO EFFECTIVE RESOLUTION). - LSAR RECORD/B (MAINTENANCE CONCEPTS).
301.2.4.2.5	DETECTABLE FAILURE ASSESSMENT	EVALUATE THOSE AGE RELATED FAILURES THAT CAN OR CANNOT BE DETECTED BY THE CREW/OPERATOR, IN ADDITION, APPLICABLE MAINTENANCE TASKS MUST BE DETERMINED INORDER TO RESTORE RELIABILITY AND SAFTEY TO ACCEPTABLE LEVELS. SOURCE OF DATA: - 301.2.4.2.3 - PREDICTABLE IMPENDING FAILURE - AGE RELATED. - HISTORICAL DATA FILE - FAILURE INTERVALS - TASK 303.2.7 - LEVEL OF REPAIR RESULTS - DI-R-3549A - - DI-L-2085A - - MIL-STD-499A - MIL-STD-847A - MIL-STD-390A (NAVY)

Name	Label	Description
ACC/CREW/MONIT/IMP/F	ACCEPTABLE CREW/OPERATR MONITORING OF IMPENDING FAILURES	PURPOSE: DATA ON THOSE CRITICAL FAILURE MODES FOR WHICH THERE IS ACCEPTABLE CREW/OPERATOR MONITORING CAPABILITIES OF DETECTING IMPENDING FAILURES. THIS DATA IS TRANFERRED TO THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11. DATA READS AS FOLLOWS: 1. IDENTIFICATION NUMBER. [LCN] (BLOCK 1.) 2. RELIABILITY CENTERED MAINTENANCE LOGIC RESULTS. (BLOCK 5.) SOURCE OF DATA: 301.2.4.2.3A3 (ACCESS LEAD TIME DETECTION TO FAILURE).
AGE/RLTD/FAIL	AGE RELATED FAILURE	PURPOSE: DATA FOR AGE RELATED FAILURES FOR TRANSFER TO THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11. DATA READS AS FOLLOWS: 1. IDENTIFICATION NUMBER. [LCN] (BLOCK 1) 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.5 (DETECTABLE FAILURE ASSESSMENT).
CRIT/CATS/FAIL	CRITICAL/ CATASTROP'C FAILURE MODE (SHSC 1, 2)	PURPOSE: A SEVERITY CLASSIFICATION ASSIGNED TO EACH IDENTIFIED FAILURE MODE AND ITEM ANALYZED IN ACCORDANCE WITH THE FOLLOWING SAFETY HAZARD SEVERITY CODES (SHSC 1&2) AS DETAILED IN (MIL-STD-1629A). CATAGORIES: 1. CATASTROPHIC - A FAILURE WHICH MAY CAUSE DEATH OR WEAPON SYSTEM LOSS(i.e.,AIRCRAFT, TANK,MISSILE,SHIP,ETC.). 2. CRITICAL - A FAILURE WHICH MAY CAUSE SEVERE INJURY,MAJOR PROPERTY DAMAGE,OR MAJOR SYSTEM DAMAGE WHICH WILL RESULT IN MISSION LOSS. SOURCE OF DATA: 301.2.4.2.1 (PIECE/PART CRITICALITY ASSESSMENT).
CRIT/COD	CRITICALITY CODE	PURPOSE: THE SUM OF THE FAILURE MODE CRITICALITY NUMBERS RELATED TO THE FAILURE MODES OF AN ITEM WITHIN SPECIFIC SEVERITY CLASSIFICATION AND MISSION PHASES. SOURCE OF DATA: LOGISTICS SUPPORT ANALYSIS REPORT (LSAR) RECORD B2. (MIL-STD-1388-2A).
DES/CHAR	DESIGN CHARACTRSTCS	PURPOSE: DATA USED IN DETERMINING THE COST,FEASIBILITY,AND TECHNOLOGY FOR REDESIGN. DESIGN CHARACTERISTICS TO BE CONSIDERED ARE AS FOLLOWS: 1. PHYSICAL LAYOUT. 2. MATERIAL CHARATERISTICS (ALLOYS,PLASTICS,CERAMICS,ETC.) 3. INTERCHANGEABILITY. 4. DESIGN COMPLEXITY 5. STATE OF THE ART. SOURCE OF DATA: PROGRAM MANAGER DATA FILE.

Name	Label	Description
DES/SPECS	DESIGN SPECIFICATNS	THIS DATA FLOW INCLUDES: I) DESIGN CHARACTERISTICS A. MATERIAL CHARACTERISTICS (ALLOYS,PLASTICS,CERAMICS,ETC.) B. PHYSICAL LAYOUT. C. INTERCHANGEABILITY. D. DESIGN COMPLEXITY. E. STATE OF THE ART. II) DESIGN SPECIFICATIONS A. PARTS LIST. B. MANUFACTURING REQUIREMENTS (NDT INSPECTION,FINISHING,ETC.). C. ASSEMBLY REQUIREMENTS. III) ENGINEERING DRAWINGS. A. DIMENSIONAL REQUIREMENT. B. CASTING/MACHINING REQUIREMENTS. SOURCE OF DATA: AQUIRING ACTIVITY FILE. (AAF)
ECO/ANALY/RSLT	ECONOMIC ASSESSMENT RESULTS	PURPOSE: THIS DATA FLOW SUPPLIES THE ANALYSIS WITH RESULTS OF THE ECONOMIC ASSESSMENT COMPLETED ON SCHEDULED VS. UNSCHEDULED MAINTENANCE TASKS. 1. COST ANALYSIS 2. MANPOWER 3. OPERATIONAL DELAY 4. EQUIPMENT SOURCE OF DATA: 301.2.4.2.2 (ECONOMIC ASSESSMENT SCH. VS.UNSCH MAINTENANCE.)
EFF/CRW/MONIT	EFFECTIVE CREW MONITORING	PURPOSE: CREW MONITORING CAPABILITY TO IDENTIFY FAILURES . TRANSFER DATA TO THE APPROPRIATE LSAR LOCATION WITHIN CARD B11. THIS DATA READS AS FOLLOWS: 1. IDENTIFICATION NUMBER. [LCN] (BLOCK 1) 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.5 (DETECTABLE FAILURE ASSESSMENT RESULTS.)
EFF/SRV/OVRHAL	EFFECTIVE SERVICING/ OVERHAUL	PURPOSE: DATA ON EFFECTIVE SERVICING AND OVERHAUL SCHEDULES. THE REQUIRED DATA IS TRANSFERRED INTO THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11. THIS DATA READS AS FOLLOWS: 1. IDENTIFICATION NUMBER. [LCN] (BLOCK 1) 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.5 (DETECTABLE FAILURE ASSESSMENT).

Name	Label	Description
FAIL/MOD	FAILURE MODE	PURPOSE: ALL PREDICTABLE FAILURE MODES FOR EACH IDENTURE LEVEL ANALYZED,IDENTIFIED AND DESCRIBED IN RELATION TO THE FOLLOWING TYPICAL FAILURE CONDITIONS: A. PREMATURE OPERATIONS. B. FAILURE TO OPERATE AT A PRESCRIBED TIME. C. INTERMITTENT OPERATION. D. FAILURE TO CEASE OPERATION AT A PRESCRIBED TIME. E. LOSS OF OUTPUT OR FAILURE DURING OPERATION. F. DEGRATED OUTPUT OR OPERATIONAL CAPABILITY. G. OTHER UNIQUE FAILURE CONDITIONS,AS APPLICABLE,BASED UPON SYSTEM CHARACTERISTICS AND POERATIONAL REPUIREMENTS OR CONSTRAINTS. SOURCE OF DATA: LOGISTICS SUPPORT ANALYSIS REPORT (LSAR) RECORD B2,CARD B13,BLOCK 6.
FAILURE INTERVALS	FAILURE INTERVALS	PURPOSE: CONTAINS HISTORICAL DATA 1. FAILURE INTERVALS 2. FAILURE CHARACTERISTICS 3. MAINTENANCE REQUIREMENTS SOURCE OF DATA: HISTORICAL DATA FILE.
FMECA/RES	FMECA ANALYSIS RESULTS - 301.2.4.1	PURPOSE: RESULTS FROM THE FAILURE MODES,EFFECT,AND CRITICALITYY ANALYSIS (FMECA) PROVIDED. THIS DATA READS AS POLLOWS: I. FMECA - TYPICAL FAILURE CONDITIONS: A. PREMATURE OPERATIONS. B. FAILURE TO OPERATE AT A PRESCRIBED TIME. C. INTERMITTENT OPERATION. D. FAILURE TO CEASE OPERATION AT A PRESCRIBED TIME. E. DEGRADED OUTPUT OR OPERATIONAL CAPABILITY. F. OTHER UNIQUE FAILURE CONDITIONS,AS APPLICABLE BASED UPON SYSTEM CHARACTERISTICS AND OPERATIONAL REQUIREMENTS OR CONSTRAINTS. II. CRITICALITY ANALYSIS - SEVERITY CLASSIFICATIONS: A. CATEGORY I - CATASTROPHIC - A FAILURE WHICH MAY CAUSE DEATH OR WEAPON SYSTEM LOSS (i.e.,AIRCRAFT, TANK,MISSLE,SHIP,ETC.) B. CATEGORY II - CRITICAL - A FAILURE WHICH MAY CAUSE SEVERE INJURY,MAJOR PROPERITY DAMAGE,OR MAJOR SYSTEM DAMAGE WHICH WILL RESULT IN MISSION LOSS. C. CATEGORY III - MARGINAL - A FAILURE WHICH MAY CAUSE MINOR INJURY,MINOR PROPERTY DAMAGE,OR MINOR SYSTEM DAMAGE WHICH DWILL RESULT IN DELAY OR LOSS OF AVAILABILITY OR MISSION DEGRADATION. D. CATEGORY IV - MINOR - A FAILURE NOT SERIOUS ENOUGH TO CAUSE INJURY,PROPERTY DAMAGE,OR SYSTEM DAMAGE ,BUT WHICH WILL RESULT IN UNSCHEDULED MAINTENANCE OR REPAIR. SOURCE OF DATA: LOGISTICS SUPPORT ANALYSIS (LSAR) RECORD B2 CARD B13 BLOCK 6. FMECA ANALYSIS - (MIL-STD-1629A).

Name	Label	Description
LOR RESULTS	LEVEL OF REPAIR RESULTS	PURPOSE: A DRAFT REPORT OF THE RESULTS OF THE EQUIPMENT/SYSTEM LEVEL OF REPAIR ANALYSIS AND REPORT IN ACCORDANCE WITH B409-1685. SOURCE OF DATA: 303.2.7 (PALMAN MODEL).
MAINT/CNCPT	MAINTENANCE CONCEPT	PURPOSE: THE BROAD,PLANNED APPROACH TO BE EMPLOYED SUSTAINING THE SYSTEM/EQUIPMENT IN A SPECIFIED CONDITION IN SUPPORT OF THE OPERATIONAL REQUIREMENT. PROVIDES THE BASIS FOR MAINTENANCE PLAN. MAINTENANCE PLAN GUIDELINES PERTAIN TO: 1. MAINTENANCE TASKS. 2. LEVELS. 3. LOCATIONS: A. ORGANIC/CONTRACTOR MAINTENANCE WORKLOAD MIX. B. CONDITION MONTORING C. FAULT ISOLATION AND TESTING APPROACH. D. COMPATIBILITY WITH EXISTING SUPPORT/TEST EQUIPMENT ETC. SOURCE OF DATA: LOGISTICS SUPPORT ANALYSIS REPORT (LSAR) RECORD B,CARD B10 BLOCK 4.
MAN/RES/COST	MANPOWER RESOLUTION COSTS	PURPOSE: THIS DATA FLOW CONTAINS IMFORMATION ON: 1. MANPOWER 2. MAN-HOURS 3. TOTAL MANPOWER REQUIREMENTS. SOURCE OF DATA: DATA STORE - HISTORICAL INSPECTION DATA FILE.
NO/EFF/RESLTN	NO EFFECTIVE RESOLUTION	PURPOSE: IDENTIFY THOSE COMPONENT FAILURES THAT CANNOT BE DETECTED BY: 1. INSTRUMENTS (GUAGES,WARNING LIGHTS,ETC.) 2. OPERATIONAL CHARACTERISTICS (VIBRATION,SOUND ETC.) IF FAILURE AGREES WITH ITEMS 1.& 2.,AN UNDETECTABLE FAILURE ANALYSIS MUST BE INVESTIGATED. SOURCE OF DATA: 301.2.4.2.5 (IMPENDING FAILURE DETECTION ASSESSMENT.)
NONCRIT/DETECT/FAIL	NONCRITICAL DETECTABLE FAILURES	PURPOSE: SAFETY HAZARD SEVERITY CODES ARE IDENTIFIED IN (MIL-STD-1629A) AND DESCRIBED AS FOLLOWS: A. CATEGORY III - MARGINAL - A FAILURE WHICH MAY CAUSE MINOR INJURY,MINOR PROPERTY DAMAGE,OR MINOR SYSTEM DAMAGE WHICH WILL RESULT IN DELAY OR LOSS OF AVAILABILITY OR MISSION DEGRADATION. B. CATEGORY IV - MINOR - A FAILURE NOT SERIOUS ENOUGH TO CAUSE INJURY,PROPERTY DAMAGE,OR SYSTEM DAMAGE,BUT WHICH WILL RESULT IN UNSCHEDULED MAINTENANCE OR REPAIR. THESE FAILURES MUST BE DETECTABLE BY: 1. INSTRUMENTATION 2. OPERATIONAL CHARACTERISTICS 3. SCHEDULED MAINTENANCE SOURCE OF DATA : 301.2.4.2.1 (PIECE/PART CRITICALITY ASSESSMENT RESULTS.)

Name	Label	Description
NONCRIT/HID/FAIL	NONCRITICAL HIDDEN FAILURES	PURPOSE: NONCRITICAL FAILURES IDENTIFIED BY THE FOLLOWING SAFTEY HAZARD SEVERITY CODES AS DESCRIBED IN (MIL-STD-1629A). A. CATEGORY III - MARGINAL - A FAILURE WHICH MAY CAUSE MINOR INJURY,MINOR PROPERTY DAMAGE,OR MINOR SYSTEM DAMAGE WHICH WILL RESULT IN DELAY OR LOSS OF AVAILABILITY OR MISSION DEGRADATION. B. CATEGORY IV - MINOR - A FAILURE NOT SERIOUS ENOUGH TO CAUSE INJURY,PROPERTY DAMAGE,OR SYSTEM DAMAGE,BUT WHICH WILL RESULT IN UNSCHEDULED MAINTENANCE OR REPAIR. SOURCE OF DATA: FMECA (MIL-STD-1629A). 301.2.4.2.1A3 (EVALUATE EFFECT OF SECONDARY FAILURE).
PRED/IMP/FAIL	PREDICTIBLE IMPENDING FAILURE-AGE RELATED	PURPOSE: IMFORMATION ON KNOWN INCIPIENT FAILURE INDICATORS (e.g., OPERATIONAL PERFORMANCE VARIATIONS) WHICH ARE PRECULIAR TO THE ITEM FAILURE TRENDS OVER A SPECIFIED PERIOD OF TIME (CALENDER DAYS). SOURCE OF DATA: 301.2.4.2.3 (IMPENDING FAILURE DETECTION ASSESSMENT)
PROB/DET/MAINT	PROBABILITY OF DETECTION -MAINTENANCE	PURPOSE: A COLLECTION OF DATA WHERE MEASURED VALUES ARE APPLIED FOR DETERMINING THE PROBABILITY OF DETECTING A IMPENDING FAILURE,AND USED IN ACCESSING MAINTENANCE REQUIREMENTS. THIS DATA IS TRANFERRED TO THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11. DATA READS AS FOLLOWS: 1. IDENTIFICATION NUMBER. (BLOCK 1) 2. RELIABILITY CENTERED MAINTENANCE LOGIC RESULTS. (BLOCK 5). SOURCE OF DATA: 301.2.4.2.3 (IMPENDING FAILURE DETECTION ASSESSMENT).
RCM/FUNCT	RCM FUNCTIONS	PURPOSE: ESSENTIAL FUNCTIONS REQUIRED TO EXECUTE THE RCM MAINTENANCE PLAN. 1. FAILURE MODE,EFFECTS,AND CRITICALITY ANALYSIS (FMECA) 2. MAINTAINABILITY 3. SAFETY ANALYSIS 4. SURVIVABILITY 5. RELIABILITY SOURCE OF DATA: - 301.2.4.2.5 DETECTABLE FAILURE ASSESSMENTS.
REDSGN/APP	REDESIGN APPLICABLE	PURPOSE: REQUIRED REDESIGN DATA TO BE TRANSFERRED TO ITS APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11. THIS CARD READS AS FOLLOWS: 1. IDENTIFICATION NUMBER [LCN] (BLOCK 1). 2. DISPOSITION (BLOCK 5) SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).
REDSGN/NOT APP	REDESIGN NOT APPLICABLE	PURPOSE: THOSE COMPONENTS FOR WHICH THE COST OF REDESIGN MAY BE PROHIBITIVE OR THE INCORPORATION OF A REDESIGN MAY NOT BE TECHNICALLY FEASIBLE. THESE ITEMS MUST BE RE-EVALUATED THROUGH THE RCM PROCESS IN ACCORDANCE WITH AMC-P-750-2. SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).

Name	Label	Description
REL/DATA	RELIABILITY DATA	PURPOSE OF DATA: APPROPRIATE RELIABILITY DATA. THE DETERMINATION OF THE POSSIBLE AND PROBABLE FAILURE MODES REQUIRES AN ANALYSIS OF RELIABILITY DATA ON THE ITEM SELECTED TO PERFORM EACH OF THE SYSTEM INTERNAL FUNCTIONS. IT IS ALWAYS DESIRABLE TO USE RELIABILITY DATA RESULTING FROM RELIABILITY TESTS ON THE SPECIFIC EQUIPMENT TO BE USED, THE TESTS PERFORMED UNDER THE IDENTICAL CONDITIONS OF USE. WHEN SUCH TESTS ARE NOT AVAILABLE, RELIABILITY DATA FROM MIL-HDBK-217 OR FROM OPERATIONAL EXPERIENCE AND TESTS PERFORMED UNDER SIMILAR USE CONDITIONS ON ITEMS SIMILAR TO THOSE IN THE SYSTEM SHOULD BE USED. SOURCE OF DATA: LOGISTICS SUPPORT ANALYSIS RECORD/B
REPLACE/OVHL	APPLICABLE & EFFECTIVE REPLACE/ OVERHAUL	PURPOSE: DATA ON THOSE COMPONENTS FOUND TO BE MORE COST EFFECTIVE TO ESTABLISH REPLACEMENT INTERVALS OR SCHEDULED OVERHAUL AFTER INDICATIONS OF WEAROUT ARE EVIDENT. THIS DATA IS TRANSFERRED TO THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11 AND READS AS FOLLOWS: 1. IDENTIFICATION NUMBER [LCN] (BLOCK 1). 2. DISPOSITION (BLOCK 5). SOURCE OF DATA: 301.2.4.2.5 (DETECTABLE FAILURE ASSESSEMENT RESULTS).
RQMT/RCM	REQUIREMENTS FOR RCM ANALYSIS - CONTRACTURAL	PURPOSE: ARMY REPRESENTATIVES AND CONTRACTORS ARE REQUIRED TO SUPPORT RELIABILITY-CENTERED-MAINTENANCE OBJECTIVES AS DESCRIBED IN AMC-P 750-2 AND DEVELOPE AN LSA STRATEGY IN REFERENCE TO MIL-STD-1388-1A (TASK 101)-DEVELOPMENT OF AN EARLY LOGISTIC SUPPORT ANALYSIS (LSA) STRATEGY AND THE FMECA ANALYSIS (MIL-STD 1629A).
SCH/MAINT/ACC	SCHEDULED MAINTENANCE ACCEPTABLTY	PURPOSE: TRANSFERS ACCEPTABLE SCHEDULED MAINTENANCE DATA TO THE APPROPRIATE LSAR BLOCK LOCATION CARD B11. THIS DATA READS AS FOLLOWS: 1. IDENTIFICATION NUMBER [LCN] (BLOCK 1). 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).
SCH/MAINT/CAND	SCHEDULED MAINTENANCE CANDIDATES	PURPOSE: SUPPLIED DATA ON THOSE CANDIDATES OF WHICH THEIR PROBABILITY FAILURE HAS BEEN MEASURED AND SCHEDULED MAINTENANCE HAS BEEN DETERMINED TO BE ECONOMICALLY JUSTIFIABLE IN ACCORDANCE TO THE RCM LOGIC PROCESS DESCRIBED IN (AMC-P-750-2). SOURCE OF DATA: 301.2.4.2.2 (ECONOMIC ASSESSMENT OF SCH. VS .UNSCH. MAINTENANCE).
SCH/MAINT/COST/EFT R	SCHEDULED MAINTENANCE COST/EFFECT REVIEW	PURPOSE: THOSE UNDETECTABLE IMPENDING FAILURES THAT REQUIRE A COST/EFFECTIVE REVIEW PRIOR TO ASSIGNING A SCHEDULED MAINTENANCE TASK. SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).

Name	Label	Description
SCH/MAINT/TSK	SCHEDULED MAINTENANCE TASK	PURPOSE: TO DOCUMENT THOSE FAILURE MODES, IN THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11, THAT REQUIRES SCHEDULED MAINTENANCE TASKS TO BE PERFORMED . THIS DATA READS: 1. IDENTIFICATION NUMBER. [LCN] (BLOCK 1) 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.2 (ECONOMICS ASSESSMENT OF SCH. VS. UNSCH. MAINTENANCE).
SCH/UNSCH/MAINT/FUNC	SCHEDULED & UNSCHEDULED MAINTENANCE FUNCTIONS	PURPOSE: DESCRIBES THE ESSENTIAL FUNCTIONS REQUIRED FOR EXECUTING THE APPLICATION OF SCHEDULED OR UNSCHEDULED MAINTENANCE PLANS. THE FUNCTIONS ARE LISTED AS FOLLOWS: 1. DETECTABILITY 2. PROBILITY OF OCCURRENCE 3. RATE OF FAILURE 4. COST EFFECTIVENESS SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).
SEC/CRIT/FAIL	SECONDARY CRITICAL FAILURES	PURPOSE: THOSE FAILURE MODES INITIALLY CLASSIFIED AS NONCRITICAL WHICH IN TURN, EXPERIENCES A SECONDARY FAILURE CLASSIFIED AS CRITICAL. THIS FAILURE MODE RESULTS IN EITHER A SAFETY HAZARD OR MISSION ABORT. SAFETY HAZARD SEVERITY CODES: A. CATEGORY I - CATASTROPHIC - A FAILURE WHICH MAY CAUSE DEATH OR WEAPON SYSTEM LOSS (i.e., AIRCRAFT, TANK, MISSLE, SHIP, ETC.). B. CATEGORY II - CRITICAL - A FAILURE WHICH MAY CAUSE SEVERE INJURY, MAJOR PROPERTY DAMAGE, OR MAJOR SYSTEM DAMAGE WHICH WILL RESULT IN MISSION LOSS. C. CATEGORY III - MARGINAL - A FAILURE WHICH MAY CAUSE MINOR INJURY, MINOR PROPERTY DAMAGE, OR MINOR SYSTEM DAMAGE WHICH WILL RESULT IN DELAY OR LOSS OF AVAILABILITY OR MISSION DEGRAADATION. D. CATEGORY IV - MINOR - A FAILURE NOT SERIOUS ENOUGH TO CAUSE INJURY, PROPERTY DAMAGE, OR SYSTEM DAMAGE, BUT WHICH WILL RESULT IN UNSCHEDULED MAINTENANCE OR REPAIR. THISE FAILURE MODE HAS TO BE ANALYZED FURTHER TO DETERMINE WHAT SCHEDULED MAINTENANCE TASKS CAN BE PERFORMED IN ORDER TO PREVENT OR DECREASE THE LIKELIHOOD THAT RELIABILITY WILL NOT FALL WITHIN ACCEPTABLE LEVELS. SOURCE OF DATA: 301.2.4.2.1 (PIECE/PART CRITICALITY ASSESSMENT). FMECA ANALYSIS (MIL-STD-1629A)
SYS/WBS	CONTRACTOR SYSTEM/EQUIP WORK BRKDN STRUCTURE LISTING	THE WORK BREAKDOWN STRUCTURE AS PROVIDED BY THE DEVELOPMENT SYSTEM/EQUIPMENT CONTRACTOR THAT CONFORMS TO THE SPECIFIC GUIDANCE PROVIDED IN MIL-STD 881 RELATIVE TO THE CATAGORY OF ITEM AND THE APPROPRIATE INDENTURE LEVELS DESCRIBING THE PARTS, PIECES, COMPONENTS, SUSASSEMBLIES, AND ASSEMBLIES WHICH CONSTITUTE THE DEVELOPMENT ITEM.
UND/CRIT/FAIL	UNDETECTABLE CRITICAL FAILURES	PURPOSE: CANDIDATE UNDETECTABLE CRITICAL FAILURES OF WHICH WOULD NOT BE DETECTED DURING ROUTINE SCHEDULED OR UNSCHEDULED MAINTENANCE. REDESIGN ALTERNATIVES TO BE INVESTIGATED. SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).

Name	Label	Description
UNDET/IMP/FAIL	UNDETECTABLE IMPENDING FAILURE	PURPOSE: DATA CONTAINING THOSE COMPONENTS WHOSE FAILURE MODE IS CRITICAL /HIDDEN AND THERE ARE NO MEANS OF DETECTION FOR PREVENTING OR REDUCING THE PROBABILITY OF OCCURRENCE. SOURCE OF DATA: 301.2.4.2.3 (RESULTS FROM IMPENDING FAILURE DETECTION ASSESSMENT).
UNS/MAINT/ACC	UNSCHEDULE MAINTENANCE ACCEPTABLTY	PURPOSE: THIS DATA FLOW IS TO AID THE ANALYSIS IN IDENTIFYING COMPONENTS THAT HAVE NONCRITICAL HIDDEN FAILURE MODES WITH NO MEANS OF DETECTING IMPENDING FAILURES OR REDUCING THE THE PROBABILITY OF OCCURRENCE. THIS DATA ,ALSO,EXPLAINS THE RISK OF INCURRING A MISSION ABORT OR SAFTY HAZARD WHICH IS UNACCEPTABLE. DATA IS RECORDED IN THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11. 1. IDENTIFICATION NUMBER. [LCN] (BLOCK 1) 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS). FMECA ANALYSIS.
UNS/MAINT/TSK	UNSHEDULED MAINTENANCE TASK	PURPOSE: TRANSFERS THE REQUIRED FMECA - MAINTENANCE DATA TO THE AAPPROPRIATE LSAR BLOCK WITHIN CARD B17. THE DATA READS: 1. IDENTIFICATION. [LCN] (BLOCK 1) 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.2A2 (PERFORM COST TRADE OFF EVALUATION). FMECA ANALYSIS.

Name	Label	Description
AAF	ACQUIRING ACTIVITY FILE	CONTAINS THOSE RECORDS, DOCUMENTS, DECISION PAPERS, SCHEDULES THAT WERE PREPARED AS PART OF THE ACQUISITION INITIATION, JUSTIFICATION, AND PLANNING PRIOR TO THE ASSIGNMENT OF A PROGRAM MANAGER. THE ITEMS IN THIS DATA STORE INCLUDE: A. REQUIRED OPERATIONAL CHARACTERISTICS B. O&O PLAN C. DESIRED R&M PARAMETERS D. THREAT ANALYSIS DATA E. READINESS OBJECTIVES DATA F. FUNTIONAL REQUIREMENTS DATA G. PROJECTED SCHEDULE DATA H. LOGISTICS RESOURCES DATA I. TOA J. TOD K. COST & OPERATIONAL EFFECTIVENESS ANALYSIS (COEA) DATA L. PROJECTED COST DATA M. JUSTIFICATION OF MAJOR SYSTEM NEW START (JMSNS) DATA
HIST/FILE	HISTORICAL DATA FILE	CONTAINS DATA PREVIOUSLY ACQUIRED ON THE ITEM UNDER INVESTIGATION OR SOME SIMILAR SYSTEM AND MAY ADDRESS THE FOLLOWING AREAS (TO BE TREATED SEPARATELY): 1. RELIABILITY DATA 2. FAILURE RATE DATA 3. SPARES AND SPARE FUNDING DATA
HIST/INSP/EXP	HISTORICAL INSPECTN EXPRNC	AN HISTORICAL FILE OF INSPECTION EXPERIENCES FOR LIKE SYSTEMS/EQUIPMENT THAT CAN BE USED AS A BASIS FOR DEVELOPMENT OF MANPOWER REQUIREMENTS, INSPECTIONS PROCEDURES AND RESULTS, AND OTHER ASSOCIATED PARAMETERS RELATED TO THE POTENTIAL INSPECTIONS OFF THE DEVELOPMENTAL SYSTEM AND/OR EQUIPMENT. THIS FILE PROVIDES THE MANPOWER RESOLUTION COSTS FOR THE COST TRADE OFF EVALUATIONS OF SUBTASK 301.2.4.2.2A2.
MAINT/PLN/FILE	MAINTENANCE PLAN FILE	THE MAINTENANCE PLAN AS REQUIRED BY THE ILSP AND DEFINED BY: DI-S-1823 DI-L-25620C DI-R-7111 DI-A-5210 MIL-STD 470A NORMALLY PREPARED BY THE SYSTEM/EQUIPMENT DEVELOPMENT CONTRACTOR AND SUBMITTED TO THE ACQUIRING ACTIVITY AND/OR THE PROGRAM MANAGER FOR REVIEW/APPROVAL. THIS FILE ALSO CONTAINS, AS APPROPRIATE, THE OUTPUT FROM: SUBTASK 301.2.4.2.2, THE RESULTS OF THE ECONOMIC EVALUATION OF THE SCHEDULED VS UNSCHEDULED MAINTENANCE ASSESSMENTS. SUBTASK 301.2.4.2.4, THE EVALUATION OF UNDETECTABLE IMPENDING FAILURES SUBTASK 301.2.4.2.5, THE EVALUATION OF THE DETECTABLE FAILURES

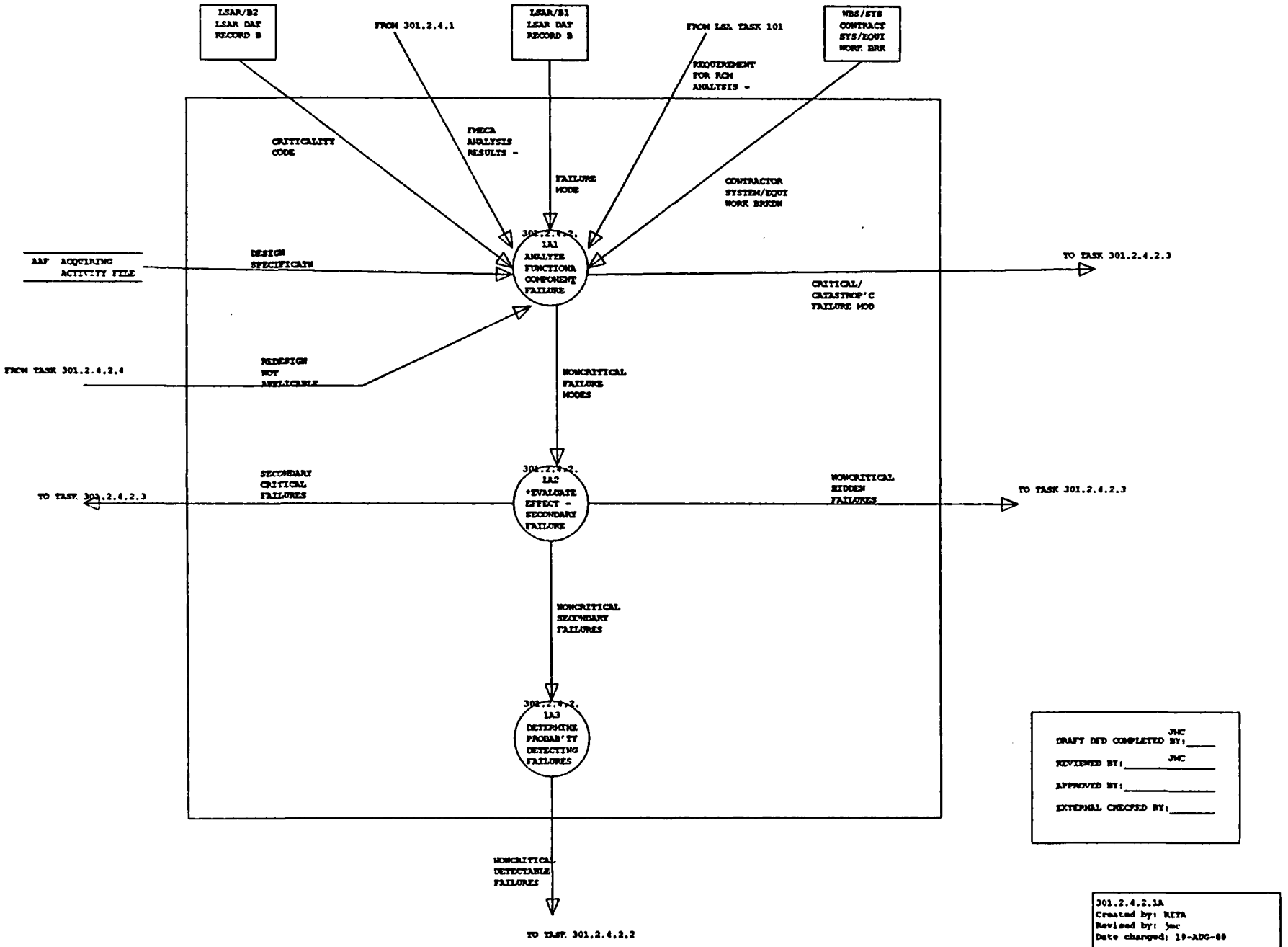
Name	Label	Description
PM/DF	PROGRAM MANAGER DATA FILE	CONTAINS THOSE FILES AND DATA WHICH ARE NORMALLY DEVELOPED BY AND/OR RETAINED BY THE PROGRAM MANAGER FOR PROPER MANAGEMENT OF THE DEVELOPMENT PROGRAM. THESE FILES INCLUDE: 1. ENGINEERING DRAWINGS 2. ENGINEERING CHARACTERISTICS 3. DT/OT RESULTS 4. CONCEPT FORMULATION PACKAGE (CFP) 5. DESIGN CONCEPT PAPER (DCP) 6. TYPE TECHNICAL REVIEWS REQUIRED 7. MILESTONE SCHEDULES 8. FUNDING PROFILES 9. REQUIRED OPERATIONAL CAPABILITIES (ROC) 10. ITEM/EQUIPMENT SPECIFICATIONS 11. ITEM/EQUIPMENT MISSIONS & FUNCTIONS 12. EQUIPMENT, MANPOWER, AND TECHNICAL RISK ASSESSMENTS (FROM LSA TASK 301.2.3 13. TRADE OFF DETERMINATION ANALYSIS (TOD) 14. TRADE OFF ANALYSIS (TOA) 15. BEST TECHNICAL APPROACH ANALYSIS (BTA) 16. COST AND OPERATIONAL-EFFECTIVENESS ANALYSIS (COEA) 17. HARDWARE SPECIFICATIONS 18. RAM REFQUIREMENTS

Name	Label	Description
LSAR/B1	LSAR DATA RECORD B1	THIS ENTITY REFERS TO THE DATA RECORD B1 OF THE LOGISTIC ANALYSIS RECORD(LSAR). THIS AREA HOLDS THE FUNCTIONS DEVELOPED IN THE FAILURE MODES AND EFFECTS ANALYSIS.
LSAR/B2	LSAR DATA RECORD B2	THIS ENTITY REFERS TO THE LOGISTIC ANALYSIS RECORD B2 (LSAR). THIS RECORD HOLDS THE FUNCTIONS DEVELOPED IN THE FMECA ANALYSIS IN REFERENCE TO CRITICALITY AND MAINTAINABILITY .
REL/B	LSAR DATA RECORD B REL DATA	ACRONYMS: THIS ENTITY REFERS TO THE LSAR DATA RECORD B UNDERLYING THE CHARACTERISTICS OF RELIABILITY,MAINTAINABILITY,AND AVAILABILITY RESULTING FROM THE FAILURE MODES,EFFECTS AND CRITICALITY ANALYSIS (FMECA).
WBS/SYS	CONTRACT SYS/EQUIP WORK BRKD STRUCTURE	THE WORK BREAKDOWN STRUCTURE IS NORMALLY PROVIDED BY THE CONTRACTOR AND PRESENTED TO THE PROGRAM MANAGER, AMC, AND/OR TRADOC FOR APPROVAL. THIS WORK BREAKDOWN STRUCTURE WILL CONFORM TO THE SPECIFIC DIRECTIONS SET FORTH IN MIL-STD 881, "WORK BREAKDOWN STRUCTURES FOR DEFENSE MATERIEL ITEMS" AND WILL BE IDENTIFIED TO ONE OF THE KEY CATEGORIES ADDRESSED IN MIL-STD 881: 1. AIRCRAFT SYSTEM 2. ELECTRONICS SYSTEM 3. MISSILE SYSTEM 4. ORDNANCE SYSTEM 5. SHIP SYSTEM 6. SPACE SYSTEM 7. SURFACE VEHICLE SYSTEM
Y/B/B11/5A/5	Y-RCRD B CARD# B11 BLCK 5A COLMN 5	ACRONYMS: LSAR - LOGISTICS SUPPORT ANALYSIS REPORT. THIS ENTITY REFERS TO THE LSAR LOCATION RECORD B CARD B11 BLOCD 5A. IT CONTAINS ALL THE COLUMNS ASSOCIATED WITH THE THE CARD.
Y/B/B11/5A/6	Y-RCRD B CARD# B11 BLCK 5A COLMN 6	ACRONYMS: LSAR - LOGISTICS SUPPORT ANALYSIS RECORD. THIS ENTITY REFERS TO A LOCATION RECORD B CARD B11 BLOCK 5A. IT CONTAINS ALL THE COLUMNS ASSOCIATED WITH THE CARD.
Y/B/B11/5B/A	Y-RECRD B CARD #B11 BLCK 5B COLMN A	ACRONYMS: LSAR - LOGISTICS SUPPORT ANALYSIS RECORD. THIS ENTITY REFERS TO THE LSAR LOCATION RECORD B CARD B11 BLOCK 5B. IT CONTAINS ALL COLUMNS ASSOCIATED WITH THE CARD.
Y/B/B11/5B/B	Y-RCRD B CARD# B11 BLCK 5B COLMN B	ACRONYM: LSAR - LOGISTICS SUPPORT ANALYSIS RECORD. THIS ENTITY REFERS TO THE LSAR LOCATION RECORD B CARD B11 BLOCK 5B. IT CONTAINS ALL THE COLUMNS ASSOCIATED WITH THE CARD.

Name	Label	Description
Y/B/B11/5B/C	Y-RCRD B CARD# B11 BLCK 5B COLMN C	ACRONYMS: LSAR - LOGISTIC SUPPORT ANALYSIS RECORD THIS ENTITY REFERS TO LSAR RECORD B CARD B11. IT CONTAINS ALL COLUMNS WITHIN THAT CARD.
Y/B/B11/5B/D	Y-RCRD B CARD# B11 BLCK 5B COLMN D	ACRONYMS: LSAR - LOGISTICS SUPPORT ANALYSIS REPORT THIS ENTITY REFERS TO THE LSAR LOCCATION RECORD B CARD B11 BLOCK 5B. IT CONTAINS ALL THE COLUMNS ASSOCIATED WITH THE CARD.
Y/B/B11/5B/E	Y-RCRD B CARD# B11 BLCK 5B COLNM E	ACRONYMS: LSAR - LOGISTICS SUPPORT ANALYSIS RECORD THIS ENTITY REFERS TO THE LSAR RECORD B CARD B11 BLOCK 5B. IT CONTAINS ALL ASSOCIATED COLUMNS ON THE CARD.

301.2.4.2.1A

PIECE/PART CRITICALITY ASSESSMENT



DRAFT DFD COMPLETED BY: JMC

REVIEWED BY: JMC

APPROVED BY:

EXTERNAL CHECKED BY:

301.2.4.2.1A
Created by: RITA
Revised by: jmc
Date changed: 19-AUG-88

Name	Label	Description
301.2.4.2.1A1	ANALYZE FUNCTIONAL COMPONENT FAILURE CRITICALTY	DETERMINE IF THE FUNCTIONAL COMPONENT FAILURE IS CRITICAL FOR SAFETY OR MISSION REQUIREMENTS,BASED ON THE FAILURE MODES AND EFFECTS ANALYSIS. THOSE FAILURE MODES THAT HAVE BEEN IDENTIFIED AS CRITICAL/ CATASTROPHIC (CORRESPONDS TO SAFETY HAZARD CODE 1 OR 2) AND WILL RESULT IN A SAFETY HAZARD OR POSSIBLE SERIOUS MISSION IMPACT WILL BE ANALYZED FURTHER TO DETERMINE IF A SCHEDULED MAINTENANCE TASK WILL HELP PREVENT DETERIORATION OF RELIABILITY OR SAFETY LEVELS, THUS MINIMIZING THE RISK OF A POSSIBLE SERIOUS MISSION IMPACT OR SAFETY HAZARD. FOR THOSE COMPONENTS CLASSIFIED WITH A SAFETY HAZARD CODE 3 OR 4, FURTHER EXPLORATION IS REQUIRED TO DETERMINE IF SCHEDULED MAINTENANCE IS REQUIRED FOR SECONDARY FAILURES WHICH ARE CRITICAL, HAVE HIDDEN FAILURES OR HAVE ECONOMICAL IMPACT. SOURCE OF DATA: - TASK 301.2.4.1 (MIL-STD-1629A, FMECA ANALYSIS). - LSAR RECORD/B2 (CRITICALITY CODE). - INQUIRING ACTIVITY FILE (DESIGN SPECIFICATIONS) - LSAR RECORD/B1 (FAILURE MODE) - TASK 101 (CONTRACTURAL REQUIREMENTS FOR RCM ANALYSIS). - CONTRACTOR (SYSTEM/EQUIPMENT BREAKDOWN STRUCTURE).
301.2.4.2.1A2	*EVALUATE EFFECT - SECONDARY FAILURE	EVALUATE POTENTIAL SECONDARY FAILURES OF NONCRITICAL FAILURES USING THE SAME PROCEDURES FOR EVALUATING PRIMARY FAILURES. IF A PRIMARY FAILURE IS NONCRITICAL AND CAUSES A SECONDARY FAILURE CLASSIFIED AS CRITICAL AND RESULTS IN EITHER A SAFETY HAZARD OR OR A MISSION ABORT, THE FAILURE MODE WILL BE ANALYZED FURTHER TO DETERMINE WHAT MAINTENANCE TASKS CAN BE PERFORMED THAT WILL PREVENT OR DECREASE THE LIKELIHOOD THAT RELIABILITY OR SAFETY WILL DETERIORATE BELOW ACCEPTABLE LEVELS. IF THE FAILURE IS CLASSIFIED NONCRITICAL, THE COMPONENT CAN BE OPERATED UNTIL FAILURE WITHOUT INCURRING A SAFETY HAZARD OR MISSION ABORT. FURTHER ANALYSES WILL BE PERFORMED TO DETERMINE IF SCHEDULED MAINTENANCE IS JUSTIFIABLE FROM THE ECONOMIC STANDPOINT. SOURCE OF DATA: - 301.2.4.2.1A1 (ANALYZE FUNCTIONAL COMPONENT FAILURE CRITICALITY). - NONCRITICAL FAILURE MODES (SHSC 3,4).
301.2.4.2.1A3	DETERMINE PROBAB'TY DETECTING FAILURES	DETERMINE THE PROBABILITY OF DETECTING A FAILURE THAT HAS OCCURED, AS OPPOSED TO DETECTING AN IMPENDING FAILURE. THIS PROCESS ASSUMES THAT THE FAILURE HAS OCCURED. IF THERE IS A RESULTANT DECREASE IN CAPABILITY OR ANY SIGNAL THAT WILL INFORM THE CREW, OPERATOR, OR MAINTENANCE PERSONNEL THAT A FAILURE HAS OCCURED PRIOR TO ITS DETERIORATION TO A POTENTIAL CRITICAL/CATASTROPHIC FAILURE,ANALYZE FAILURE MODE FURTHER TO DETERMINE WHAT SCHEDULED MAINTENANCE TASKS CAN BE PERFORMED. SOURCE OF DATA: - 301.2.4.2.1A2 (EVALUATE EFFECT - SECONDARY FAILURE). - NONCRITICAL SECONDARY FAILURES

Name	Label	Description
CRIT/CATS/FAIL	CRITICAL/ CATASTROP'C FAILURE MODE (SHSC 1, 2)	PURPOSE: A SEVERITY CLASSIFICATION ASSIGNED TO EACH IDENTIFIED FAILURE MODE AND ITEM ANALYZED IN ACCORDANCE WITH THE FOLLOWING SAFETY HAZARD SEVERITY CODES (SHSC 1&2) AS DETAILED IN (MIL-STD-1629A). CATAGORIES: 1. CATASTROPHIC - A FAILURE WHICH MAY CAUSE DEATH OR WEAPON SYSTEM LOSS(i.e.,AIRCRAFT, TANK,MISSILE,SHIP,ETC.). 2. CRITICAL - A FAILURE WHICH MAY CAUSE SEVERE INJURY,MAJOR PROPERTY DAMAGE,OR MAJOR SYSTEM DAMAGE WHICH WILL RESULT IN MISSION LOSS. SOURCE OF DATA: 301.2.4.2.1 (PIECE/PART CRITICALITY ASSESSMENT).
CRIT/COD	CRITICALITY CODE	PURPOSE: THE SUM OF THE FAILURE MODE CRITICALITY NUMBERS RELATED TO THE FAILURE MODES OF AN ITEM WITHIN SPECIFIC SEVERITY CLASSIFICATION AND MISSION PHASES. SOURCE OF DATA: LOGISTICS SUPPORT ANALYSIS REPORT (LSAR) RECORD B2. (MIL-STD-1388-2A).
DES/SPECS	DESIGN SPECIFICATNS	THIS DATA FLOW INCLUDES: I) DESIGN CHARACTERISTICS A. MATERIAL CHARACTERISTICS (ALLOYS,PLASTICS,CERAMICS,ETC.) B. PHYSICAL LAYOUT. C. INTERCHANGEABILITY. D. DESIGN COMPLEXITY. E. STATE OF THE ART. II) DESIGN SPECIFICATIONS A. PARTS LIST. B. MANUFACTURING REQUIREMENTS (NDT INSPECTION,FINISHING,ETC.). C. ASSEMBLY REQUIREMENTS. III) ENGINEERING DRAWINGS. A. DIMENSIONAL REQUIREMENT. B. CASTING/MACHINING REQUIREMENTS. SOURCE OF DATA: AQUIRING ACTIVITY FILE. (AAF)
FAIL/MOD	FAILURE MODE	PURPOSE: ALL PREDICTABLE FAILURE MODES FOR EACH IDENTURE LEVEL ANALYZED,IDENTIFIED AND DESCRIBED IN RELATION TO THE FOLLOWING TYPICAL FAILURE CONDITIONS: A. PREMATURE OPERATIONS. B. FAILURE TO OPERATE AT A PRESCRIBED TIME. C. INTERMITTENT OPERATION. D. FAILURE TO CEASE OPERATION AT A PRESCRIBED TIME. E. LOSS OF OUTPUT OR FAILURE DURING OPERATION. F. DEGRATED OUTPUT OR OPERATIONAL CAPABILITY. G. OTHER UNIQUE FAILURE CONDITIONS,AS APPLICABLE,BASED UPON SYSTEM CHARACTERISTICS AND POERATIONAL REPUIREMENTS OR CONSTRAINTS. SOURCE OF DATA: LOGISTICS SUPPORT ANALYSIS REPORT (LSAR) RECORD B2,CARD B13,BLOCK 6.

Name	Label	Description
FMECA/RES	FMECA ANALYSIS RESULTS - 301.2.4.1	PURPOSE: RESULTS FROM THE FAILURE MODES,EFFECT,AND CRITICALITYY ANALYSIS (FMECA) PROVIDED. THIS DATA READS AS FOLLOWS: I. FMECA - TYPICAL FAILURE CONDITIONS: A. PREMATURE OPERATIONS. B. FAILURE TO OPERATE AT A PRESCRIBED TIME. C. INTERMITTENT OPERATION. D. FAILURE TO CEASE OPERATION AT A PRESCRIBED TIME. E. DEGRADED OUTPUT OR OPERATIONAL CAPABILITY. F. OTHER UNIQUE FAILURE CONDITIONS,AS APPLICABLE BASED UPON SYSTEM CHARACTERISTICS AND OPERATIONAL REQUIREMENTS OR CONSTRAINTS. II. CRITICALITY ANALYSIS - SEVERITY CLASSIFICATIONS: A. CATEGORY I - CATASTROPHIC - A FAILURE WHICH MAY CAUSE DEATH OR WEAPON SYSTEM LOSS (i.e.,AIRCRAFT, TANK,MISSLE,SHIP,ETC.) B. CATEGORY II - CRITICAL - A FAILURE WHICH MAY CAUSE SEVERE INJURY,MAJOR PROPERITY DAMAGE,OR MAJOR SYSTEM DAMAGE WHICH WILL RESULT IN MISSION LOSS. C. CATEGORY III - MARGINAL - A FAILURE WHICH MAY CAUSE MINOR INJURY,MINOR PROPERTY DAMAGE,OR MINOR SYSTEM DAMAGE WHICH DWILL RESULT IN DELAY OR LOSS OF AVAILABILITY OR MISSION DEGRADATION. D. CATEGORY IV - MINOR - A FAILURE NOT SERIOUS ENOUGH TO CAUSE INJURY,PROPERTY DAMAGE,OR SYSTEM DAMAGE ,BUT WHICH WILL RESULT IN UNSCHEDULED MAINTENANCE OR REPAIR. SOURCE OF DATA: LOGISTICS SUPPORT ANALYSIS (LSAR) RECORD B2 CARD B13 BLOCK 6. FMECA ANALYSIS - (MIL-STD-1629A).
NONCRIT/CATS/FAIL	NONCRITICAL/ FAILURE MODES (SHSC 3,4)	PURPOSE: NONCRITICAL FAILURE MODES CLASSIFIED WITH A SHSC 3 OR 4 AND REQUIRES FURTHER EXPLORATION INTO DETERMINING IF SCHEDULED MAINTENANCE IS REQUIRED FOR SECONDARY FAILURES WHICH ARE CRITICAL,HAVE HIDDEN FAILURES,OR HAVE ECONOMICAL IMPACT. SOURCE OF DATA: 301.2.4.2.1A1 (ANALYZE FUNCTIONAL COMPONENT FAILURE CRITICALITY.)

Name	Label	Description
NONCRIT/DETECT/FAIL	NONCRITICAL DETECTABLE FAILURES	PURPOSE: SAFETY HAZARD SEVERITY CODES ARE IDENTIFIED IN (MIL-STD-1629A) AND DESCRIBED AS FOLLOWS: A. CATEGORY III - MARGINAL - A FAILURE WHICH MAY CAUSE MINOR INJURY,MINOR PROPERTY DAMAGE,OR MINOR SYSTEM DAMAGE WHICH WILL RESULT IN DELAY OR LOSS OF AVAILABILITY OR MISSION DEGRADATION. B. CATEGORY IV - MINOR - A FAILURE NOT SERIOUS ENOUGH TO CAUSE INJURY,PROPERTY DAMAGE,OR SYSTEM DAMAGE,BUT WHICH WILL RESULT IN UNSCHEDULED MAINTENANCE OR REPAIR. THESE FAILURES MUST BE DETECTABLE BY: 1. INSTRUMENTATION 2. OPERATIONAL CHARACTERISTICS 3. SCHEDULED MAINTENANCE SOURCE OF DATA : 301.2.4.2.1 (PIECE/PART CRITICALITY ASSESSMENT RESULTS.)
NONCRIT/HID/FAIL	NONCRITICAL HIDDEN FAILURES	PURPOSE: NONCRITICAL FAILURES IDENTIFIED BY THE FOLLOWING SAFTEY HAZARD SEVERITY CODES AS DESCRIBED IN (MIL-STD-1629A). A. CATEGORY III - MARGINAL - A FAILURE WHICH MAY CAUSE MINOR INJURY,MINOR PROPERTY DAMAGE,OR MINOR SYSTEM DAMAGE WHICH WILL RESULT IN DELAY OR LOSS OF AVAILABILITY OR MISSION DEGRADATION. B. CATEGORY IV - MINOR - A FAILURE NOT SERIOUS ENOUGH TO CAUSE INJURY,PROPERTY DAMAGE,OR SYSTEM DAMAGE,BUT WHICH WILL RESULT IN UNSCHEDULED MAINTENANCE OR REPAIR. SOURCE OF DATA: FMECA (MIL-STD-1629A). 301.2.4.2.1A3 (EVALUATE EFFECT OF SECONDARY FAILURE).
NONCRIT/SECDRY/FAILS	NONCRITICAL SECONDARY FAILURES	PURPOSE: TO AID THE ANALYSIS IN DETERMINING THOSE NONCRITICAL SECONDARY FAILURES THAT MAY BE OPERATED TO FAILURE WITHOUT INCURRING A SAFTY HAZARD OR MISSION ABORT.
REDSGN/NOT APP	REDESIGN NOT APPLICABLE	PURPOSE: THOSE COMPONENTS FOR WHICH THE COST OF REDESIGN MAY BE PROHIBITIVE OR THE INCORPORATION OF A REDESIGN MAY NOT BE TECHNICALLY FEASIBLE. THESE ITEMS MUST BE RE-EVALUATED THROUGH THE RCM PROCESS IN ACCORDANCE WITH AMC-P-750-2. SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).
RQMT/RCM	REQUIREMENTS FOR RCM ANALYSIS - CONTRACTURAL	PURPOSE: ARMY REPRESENTATIVES AND CONTRACTORS ARE REQUIRED TO SUPPORT RELIABILITY-CENTERED-MAINTENANCE OBJECTIVES AS DESCRIBED IN AMC-P 750-2 AND DEVELOPE AN LSA STRATEGY IN REFERENCE TO MIL-STD-1388-1A (TASK 101)-DEVELOPMENT OF AN EARLY LOGISTIC SUPPORT ANALYSIS (LSA) STRATEGY AND THE FMECA ANALYSIS (MIL-STD 1629A).

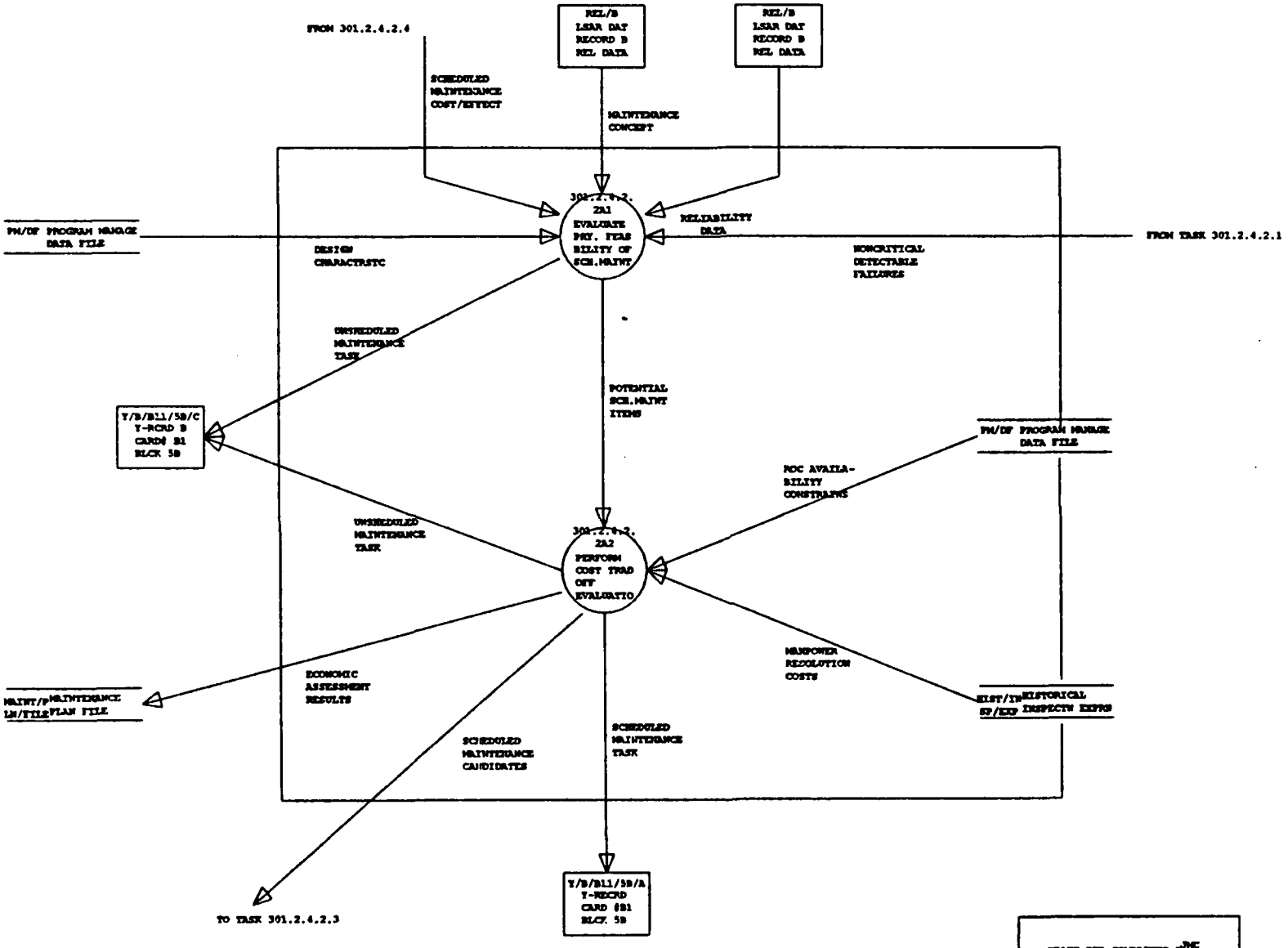
Name	Label	Description
SEC/CRIT/FAIL	SECONDARY CRITICAL FAILURES	PURPOSE: THOSE FAILURE MODES INITIALLY CLASSIFIED AS NONCRITICAL WHICH IN TURN,EXPERIENCES A SECONDARY FAILURE CLASSIFIED AS CRITICAL. THIS FAILURE MODE RESULTS IN EITHER A SAFETY HAZARD OR MISSION ABORT. SAFETY HAZARD SEVERITY CODES: A. CATEGORY I - CATASTROPHIC - A FAILURE WHICH MAY CAUSE DEATH OR WEAPON SYSTEM LOSS (i.e.,AIRCRAFT,TANK,MISSLE, SHIP,ETC.). B. CATEGORY II - CRITICAL - A FAILURE WHICH MAY CAUSE SEVERE INJURY,MAJOR PROPERTY DAMAGE,OR MAJOR SYSTEM DAMAGE WHICH WILL RESULT IN MISSION LOSS. C. CATEGORY III - MARGINAL - A FAILURE WHICH MAY CAUSE MINOR INJURY,MINOR PROPERTY DAMAGE,OR MINOR SYSTEM DAMAGE WHICH WILL RESULT IN DELAY OR LOSS OF AVAILABILITY OR MISSION DEGRAADATION. D. CATEGORY IV - MINOR - A FAILURE NOT SERIOUS ENOUGH TO CAUSE INJURY,PROPERTY DAMAGE, OR SYSTEM DAMAGE, BUT WHICH WILL RESULT IN UNSCHEDULED MAINTENANCE OR REPAIR. THISE FAILURE MODE HAS TO BE ANALYZED FURTHER TO DETERMINE WHAT SCHEDULED MAINTENANCE TASKS CAN BE PERFORMED IN ORDER TO PREVENT OR DECREASE THE LIKELIHOOD THAT RELIABILITY WILL NOT FALL WITHIN ACCEPTABLE LEVELS. SOURCE OF DATA: 301.2.4.2.1 (PIECE/PART CRITICALITY ASSESSMENT). FMECA ANALYSIS (MIL-STD-1629A)
SYS/WBS	CONTRACTOR SYSTEM/EQUIP WORK BRKDN STRUCTURE LISTING	THE WORK BREAKDOWN STRUCTURE AS PROVIDED BY THE DEVELOPMENT SYSTEM/EQUIPMENT CONTRACTOR THAT CONFORMS TO THE SPECIFIC GUIDANCE PROVIDED IN MIL-STD 881 RELATIVE TO THE CATAGORY OF ITEM AND THE APPROPRIATE INDENTURE LEVELS DESCRIBING THE PARTS, PIECES, COMPONENTS, SUSASSEMBLIES, AND ASSEMBLIES WHICH CONSTITUTE THE DEVELOPMENT ITEM.

Name	Label	Description
AAF	ACQUIRING ACTIVITY FILE	CONTAINS THOSE RECORDS, DOCUMENTS, DECISION PAPERS, SCHEDULES THAT WERE PREPARED AS PART OF THE ACQUISITION INITIATION, JUSTIFICATION, AND PLANNING PRIOR TO THE ASSIGNMENT OF A PROGRAM MANAGER. THE ITEMS IN THIS DATA STORE INCLUDE: A. REQUIRED OPERATIONAL CHARACTERISTICS B. O&O PLAN C. DESIRED R&M PARAMETERS D. THREAT ANALYSIS DATA E. READINESS OBJECTIVES DATA F. FUNTIONAL REQUIREMENTS DATA G. PROJECTED SCHEDULE DATA H. LOGISTICS RESOURCES DATA I. TOA J. TOD K. COST & OPERATIONAL EFFECTIVENESS ANALYSIS (COEA) DATA L. PROJECTED COST DATA M. JUSTIFICATION OF MAJOR SYSTEM NEW START (JMSNS) DATA

Name	Label	Description
LSAR/B1	LSAR DATA RECORD B1	THIS ENTITY REFERS TO THE DATA RECORD B1 OF THE LOGISTIC ANALYSIS RECORD(LSAR). THIS AREA HOLDS THE FUNCTIONS DEVELOPED IN THE FAILURE MODES AND EFFECTS ANALYSIS.
LSAR/B2	LSAR DATA RECORD B2	THIS ENTITY REFERS TO THE LOGISTIC ANALYSIS RECORD B2 (LSAR). THIS RECORD HOLDS THE FUNCTIONS DEVELOPED IN THE FMECA ANALYSIS IN REFERENCE TO CRITICALITY AND MAINTAINABILITY .
WBS/SYS	CONTRACT SYS/EQUIP WORK BRKD STRUCTURE	THE WORK BREAKDOWN STRUCTURE IS NORMALLY PROVIDED BY THE CONTRACTOR AND PRESENTED TO THE PROGRAM MANAGER, AMC, AND/OR TRADOC FOR APPROVAL. THIS WORK BREAKDOWN STRUCTURE WILL CONFORM TO THE SPECIFIC DIRECTIONS SET FORTH IN MIL-STD 881, "WORK BREAKDOWN STRUCTURES FOR DEFENSE MATERIEL ITEMS" AND WILL BE IDENTIFIED TO ONE OF THE KEY CATEGORIES ADDRESSED IN MIL-STD 881: 1. AIRCRAFT SYSTEM 2. ELECTRONICS SYSTEM 3. MISSILE SYSTEM 4. ORDNANCE SYSTEM 5. SHIP SYSTEM 6. SPACE SYSTEM 7. SURFACE VEHICLE SYSTEM

301.2.4.2.2A

ECONOMIC ASSESSMENT - SCHEDULED vs UNSCHEDULED



DRAFT DFD COMPLETED BY: JMC

REVIEWED BY: _____

APPROVED BY: _____

EXTERNAL CHECKED BY: _____

301.2.4.2.2A
Created by: RITA
Revised by: jmc
Date changed: 19-AUG-88

Name	Label	Description
301.2.4.2.2A1	EVALUATE PHY. FEASI BILITY OF SCH.MAINT.	IDENTIFY AND EVALUATE THE EFFICIENCY OF SCHEDULED MAINTENANCE ON THE ITEM/EQUIPMENT/COMPONENT UNDER ANALYSIS. THIS MUST BE CONSIDERED IN TWO PARTS: FIRST, THE IMPENDING FAILURE MUST BE PHYSICALLY DETECTABLE EITHER BY VISUAL INSPECTION, THROUGH USE OF TEST OR MEASUREMENT EQUIPMENT. TO BE DETECTABLE, MEASUREABLE PHYSICAL PROPERTIES (OR SIGNATURE) OF THE COMPONENT MUST CHANGE WITH THE ONSET OF DEGRADATION TO ALLOW IDENTIFICATION OF IMPENDING FAILURE THROUGH COMPARISON WITH NORMAL PROPERTIES OR A BASELINE SIGNATURE. THE SECOND CONSIDERATION IS THE PROBABILITY THAT THE SCHEDULED MAINTENANCE TASK WILL COINCIDE WITH THE TIME BETWEEN ONSET OF THE DEGRADATION AND THE OCCURANCE OF A FAILURE SO THAT THE IMPENDING FAILURE WILL BE DETECTED AND CORRECTED BEFORE IT OCCURES. SOURCE OF DATA: - LSAR RECORD/B: - RELIABILITY DATA - MAINTENANCE CONCEPTS - PROGRAM MANAGER FILE(DESIGN CHARACTERISTICS). - 301.2.4.2.1(NONCRITICAL DETECTABLE FAILURES)
301.2.4.2.2A2	PERFORM COST TRADE OFF EVALUATION	DETERMINE IF A SCHEDULED MAINTENANCE TASK IS ECONOMICALLY JUSTIFIED. THE DIFFERENCE IN OWNERSHIP COST FOR THE END ITEM MUST BE CALCULATED. IT IS NOT INTENDED THAT A COMPLETE LIFE-CYCLE COST BE CALCULATED FOR EACH ALTERNATIVE, BUT RATHER THOSE COST FACTORS WHICH WOULD BE DIFFERENT BETWEEN THE ALTERNATIVES SHOULD BE DETERMINED. THE ANALYSIS SHOWS THAT SCHEDULED MAINTENANCE TASKS ON THE NONCRITICAL COMPONENTS REDUCES THE COST OF OWNERSHIP OF THE SYSTEM/EQUIPMENT, THEN THE TASKS SHOULD BE INCLUDED IN THE OVERALL MAINTENANCE PLAN. IF A SCHEDULED MAINTENANCE TASK IS NOT FEASIBLE OR IS NOT ECONOMICALLY JUSTIFIED FOR THE NONCRITICAL COMPONENT UNDER ANALYSIS, THEN THE COMPONENT WOULD BE OPERATED UNTIL FAILURE AND ONLY UNSCHEDULED MAINTENANCE WOULD BE PERFORMED. THE OTHER ALTERNATIVE IS REDESIGN OF THE ITEM IF ECONOMICALLY FEASIBLE. SOURCE OF DATA: - POTENTIAL SCHEDULED MAINTENANCE ITEMS. - PROGRAM MANAGER DATA FILE (ROC AVAILABILITY CONSTRAINTS) - HISTORICAL INSPECTION FILE (MANPOWER RESOLUTION COSTS.)

Name	Label	Description
DES/CHAR	DESIGN CHARACTRSTCS	PURPOSE: DATA USED IN DETERMINING THE COST,FEASIBILITY,AND TECHNOLOGY FOR REDESIGN. DESIGN CHARACTERISTICS TO BE CONSIDERED ARE AS FOLLOWS: 1. PHYSICAL LAYOUT. 2. MATERIAL CHARATERISTICS (ALLOYS,PLASTICS,CERAMICS,ETC.) 3. INTERCHANGEABILITY. 4. DESIGN COMPLEXITY 5. STATE OF THE ART. SOURCE OF DATA: PROGRAM MANAGER DATA FILE.
ECO/ANALY/RSLT	ECONOMIC ASSESSMENT RESULTS	PURPOSE: THIS DATA FLOW SUPPLIES THE ANALYSIS WITH RESULTS OF THE ECONOMIC ASSESSMENT COMPLETED ON SCHEDULED VS. UNSCHEDULED MAINTENANCE TASKS. 1. COST ANALYSIS 2. MANPOWER 3. OPERATIONAL DELAY 4. EQUIPMENT SOURCE OF DATA: 301.2.4.2.2 (ECONOMIC ASSESSMENT SCH. VS.UNSCH MAINTENANCE.)
MAINT/CNCPT	MAINTENANCE CONCEPT	PURPOSE: THE BROAD,PLANNED APPROACH TO BE EMPLOYED SUSTAINING THE SYSTEM/EQUIPMENT IN A SPECIFIED CONDITION IN SUPPORT OF THE OPERATIONAL REQUIREMENT. PROVIDES THE BASIS FOR MAINTENANCE PLAN. MAINTENANCE PLAN *GUIDELINES PERTAIN* TO: 1. MAINTENANCE TASKS. 2. LEVELS. 3. LOCATIONS: A. ORGANIC/CONTRACTOR MAINTENANCE WORKLOAD MIX. B. CONDITION MONTORING C. FAULT ISOLATION AND TESTING APPROACH. D. COMPATIBILITY WITH EXISTING SUPPORT/TEST EQUIPMENT ETC. SOURCE OF DATA: LOGISTICS SUPPORT ANALYSIS REPORT (LSAR) RECORD B,CARD B10 BLOCK 4.
MAN/RES/COST	MANPOWER RESOLUTION COSTS	PURPOSE: THIS DATA FLOW CONTAINS IMFORMATION ON: 1. MANPOWER 2. MAN-HOURS 3. TOTAL MANPOWER REQUIREMENTS. SOURCE OF DATA: DATA STORE - HISTORICAL INSPECTION DATA FILE.

Name	Label	Description
NONCRIT/DETECT/FAIL	NONCRITICAL DETECTABLE FAILURES	PURPOSE: SAFETY HAZARD SEVERITY CODES ARE IDENTIFIED IN (MIL-STD-1629A) AND DESCRIBED AS FOLLOWS: A. CATEGORY III - MARGINAL - A FAILURE WHICH MAY CAUSE MINOR INJURY,MINOR PROPERTY DAMAGE,OR MINOR SYSTEM DAMAGE WHICH WILL RESULT IN DELAY OR LOSS OF AVAILABILITY OR MISSION DEGRADATION. B. CATEGORY IV - MINOR - A FAILURE NOT SERIOUS ENOUGH TO CAUSE INJURY,PROPERTY DAMAGE,OR SYSTEM DAMAGE,BUT WHICH WILL RESULT IN UNSCHEDULED MAINTENANCE OR REPAIR. THESE FAILURES MUST BE DETECTABLE BY: 1. INSTRUMENTATION 2. OPERATIONAL CHARACTERISTICS 3. SCHEDULED MAINTENANCE SOURCE OF DATA : 301.2.4.2.1 (PIECE/PART CRITICALITY ASSESSMENT RESULTS.)
POT/SCH/MAINT/ITM	POTENTIAL SCH.MAINT ITEMS	PURPOSE: IDENTIFYING SCHEDULED MAINTENANCE TASKS THAT WILL DECREASE THE COST OF OWNERSHIP OF THE END ITEM. SOURCE OF DATA: 301.2.4.2.2A1 (EVALUATE PHY. FEASIBILITY OF SCH. MAINTENANCE.)
REL/DATA	RELIABILITY DATA	PURPOSE OF DATA: APPROPRIATE RELIABILITY DATA. THE DETERMINATION OF THE POSSIBLE AND PROBABLE FAILURE MODES REQUIRES AN ANALYSIS OF RELIABILITY DATA ON THE ITEM SELECTED TO PERFORM EACH OF THE SYSTEM INTERNAL FUNCTIONS. IT IS ALWAYS DESIRABLE TO USE RELIABILITY DATA RESULTING FROM RELIABILITY TESTS ON THE SPECIFIC EQUIPMENT TO BE USED, THE TESTS PERFORMED UNDER THE IDENTICAL CONDITIONS OF USE. WHEN SUCH TESTS ARE NOT AVAILABLE, RELIABILITY DATA FROM MIL-HDBK-217 OR FROM OPERATIONAL EXPERIENCE AND TESTS PERFORMED UNDER SIMILAR USE CONDITIONS ON ITEMS SIMILAR TO THOSE IN THE SYSTEM SHOULD BE USED. SOURCE OF DATA: LOGISTICS SUPPORT ANALYSIS RECORD/B
ROC/AVAIL	ROC AVAILABILITY CONSTRAINS	PURPOSE: PROVIDES THE ANALYSIS WITH LIMITATIONS OF THOSE SYSTEM CHARACTERISTICS WHICH HAVE SIGNIFICANT EFFECT ON A SYSTEM'S READINESS VALUE. THESE MAY BE DESIGN (HARDWARE OR SOFTWARE),SUPPORT,OR OPERATIONAL CHARACTERISTICS. SOURCE OF DATA: PROGRAM MANAGER DATA FILE.
SCH/MAINT/CAND	SCHEDULED MAINTENANCE CANDIDATES	PURPOSE: SUPPLIED DATA ON THOSE CANDIDATES OF WHICH THEIR PROBABILITY FAILURE HAS BEEN MEASURED AND SCHEDULED MAINTENANCE HAS BEEN DETERMINED TO BE ECONOMICALLY JUSTIFIABLE IN ACCORDANCE TO THE RCM LOGIC PROCESS DESCRIBED IN (AMC-P-750-2). SOURCE OF DATA: 301.2.4.2.2 (ECONOMIC ASSESSMENT OF SCH. VS .UNSCH. MAINTENANCE).

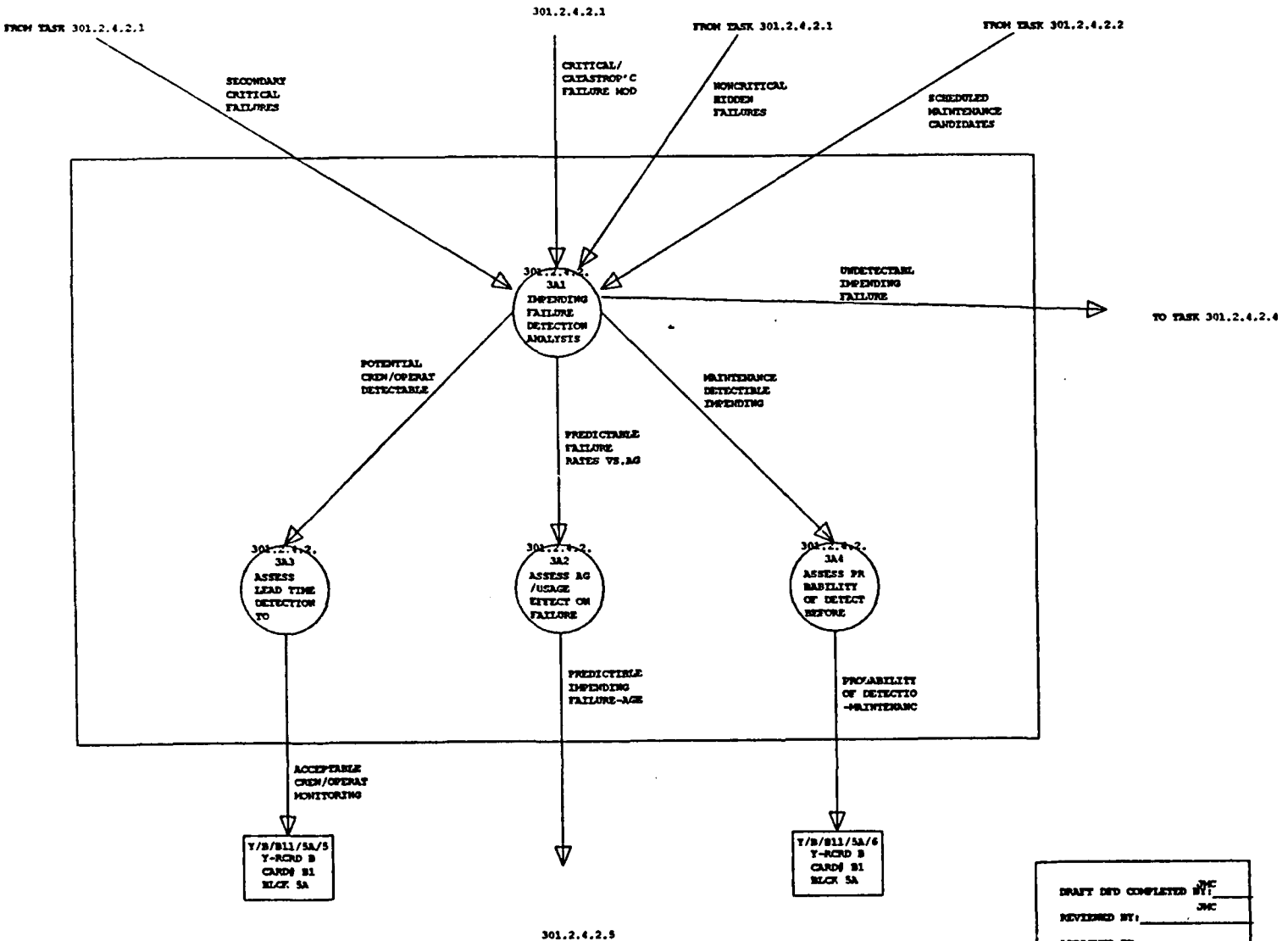
Name	Label	Description
SCH/MAINT/COST/EFT R	SCHEDULED MAINTENANCE COST/EFFECT REVIEW	PURPOSE: THOSE UNDETECTABLE IMPENDING FAILURES THAT REQUIRE A COST/EFFECTIVE REVIEW PRIOR TO ASSIGNING A SCHEDULED MAINTENANCE TASK. SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).
SCH/MAINT/TSK	SCHEDULED MAINTENANCE TASK	PURPOSE: TO DOCUMENT THOSE FAILURE MODES,IN THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11,THAT REQUIRES SCHEDULED MAINTENANCE TASKS TO BE PERFORMED . THIS DATA READS: 1. IDENTIFICATION NUMBER. [LCN] (BLOCK 1) 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.2 (ECONOMICS ASSESSMENT OF SCH. VS. UNSCH. MAINTENANCE).
UNS/MAINT/TSK	UNSHEDULED MAINTENANCE TASK	PURPOSE: TRANSFERS THE REQUIRED FMECA - MAINTENANCE DATA TO THE AAPPROPRIATE LSAR BLOCK WITHIN CARD B17. THE DATA READS: 1. IDENTIFICATION. [LCN] (BLOCK 1) 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.2A2 (PERFORM COST TRADE OFF EVALUATION). FMECA ANALYSIS.

Name	Label	Description
HIST/INSP/EXP	HISTORICAL INSPECTN EXPRNC	AN HISTORICAL FILE OF INSPECTION EXPERIENCES FOR LIKE SYSTEMS/EQUIPMENT THAT CAN BE USED AS A BASIS FOR DEVELOPMENT OF MANPOWER REQUIREMENTS, INSPECTIONS PROCEDURES AND RESULTS, AND OTHER ASSOCIATED PARAMETERS RELATED TO THE POTENTIAL INSPECTIONS OFF THE DEVELOPMENTAL SYSTEM AND/OR EQUIPMENT. THIS FILE PROVIDES THE MANPOWER RESOLUTION COSTS FOR THE COST TRADE OFF EVALUATIONS OF SUBTASK 301.2.4.2.2A2.
MAINT/PLN/FILE	MAINTENANCE PLAN FILE	THE MAINTENANCE PLAN AS REQUIRED BY THE ILSP AND DEFINED BY: DI-S-1823 DI-L-25620C DI-R-7111 DI-A-5210 MIL-STD 470A NORMALLY PREPARED BY THE SYSTEM/EQUIPMENT DEVELOPMENT CONTRACTOR AND SUBMITTED TO THE ACQUIRING ACTIVITY AND/OR THE PROGRAM MANAGER FOR REVIEW/APPROVAL. THIS FILE ALSO CONTAINS, AS APPROPRIATE, THE OUTPUT FROM: SUBTASK 301.2.4.2.2, THE RESULTS OF THE ECONOMIC EVALUATION OF THE SCHEDULED VS UNSCHEDULED MAINTENANCE ASSESSMENTS. SUBTASK 301.2.4.2.4, THE EVALUATION OF UNDETECTABLE IMPENDING FAILURES SUBTASK 301.2.4.2.5, THE EVALUATION OF THE DETECTABLE FAILURES
PM/DF	PROGRAM MANAGER DATA FILE	CONTAINS THOSE FILES AND DATA WHICH ARE NORMALLY DEVELOPED BY AND/OR RETAINED BY THE PROGRAM MANAGER FOR PROPER MANAGEMENT OF THE DEVELOPMENT PROGRAM. THESE FILES INCLUDE: 1. ENGINEERING DRAWINGS 2. ENGINEERING CHARACTERISTICS 3. DT/OT RESULTS 4. CONCEPT FORMULATION PACKAGE (CFP) 5. DESIGN CONCEPT PAPER (DCP) 6. TYPE TECHNICAL REVIEWS REQUIRED 7. MILESTONE SCHEDULES 8. FUNDING PROFILES 9. REQUIRED OPERATIONAL CAPABILITIES (ROC) 10. ITEM/EQUIPMENT SPECIFICATIONS 11. ITEM/EQUIPMENT MISSIONS & FUNCTIONS 12. EQUIPMENT, MANPOWER, AND TECHNICAL RISK ASSESSMENTS (FROM LSA TASK 301.2.3 13. TRADE OFF DETERMINATION ANALYSIS (TOD) 14. TRADE OFF ANALYSIS (TOA) 15. BEST TECHNICAL APPROACH ANALYSIS (BTA) 16. COST AND OPERATIONAL-EFFECTIVENESS ANALYSIS (COEA) 17. HARDWARE SPECIFICATIONS 18. RAM REFQUIREMENTS

Name	Label	Description
REL/B	LSAR DATA RECORD B REL DATA	ACRONYMS: THIS ENTITY REFERS TO THE LSAR DATA RECORD B UNDERLYING THE CHARACTERISTICS OF RELIABILITY,MAINTAINABILITY,AND AVAILABILITY RESULTING FROM THE FAILURE MODES,EFFECTS AND CRITICALITY ANALYSIS (FMECA).
Y/B/B11/5B/A	Y-RECRD B CARD #B11 BLCK 5B COLMN A	ACRONYMS: LSAR - LOGISTICS SUPPORT ANALYSIS RECORD. THIS ENTITY REFERS TO THE LSAR LOCATION RECORD B CARD B11 BLOCK 5B. IT CONTAINS ALL COLUMNS ASSOCIATED WITH THE CARD.
Y/B/B11/5B/C	Y-RCRD B CARD# B11 BLCK 5B COLMN C	ACRONYMS: LSAR - LOGISTIC SUPPORT ANALYSIS RECORD THIS ENTITY REFERS TO LSAR RECORD B CARD B11. IT CONTAINS ALL COLUMNS WITHIN THAT CARD.

301.2.4.2.3A

IMPENDING FAILURE DETECTION ASSESSMENT



DRAFT DID COMPLETED BY: JMC

REVIEWED BY: JMC

APPROVED BY:

EXTERNAL CHECKED BY:

301.2.4.2.3A
Created by: RITA
Revised by: jmc
Date changed: 19-AUG-88

Name	Label	Description
301.2.4.2.3A1	IMPENDING FAILURE DETECTION ANALYSIS	UTILIZE THE RESULTS OF THE FAILURE MODE, EFFECTS, AND CRITICALITY ANALYSIS TO DETERMINE AND IDENTIFY THOSE CRITICAL FAILURES THAT CAN BE OVERCOME THROUGH THE IMPLEMENTATION OF SPECIFIC SCHEDULED MAINTENANCE TASKS. THE SCHEDULED MAINTENANCE WILL HELP PREVENT DETERIORATION OF RELIABILITY OR SAFETY LEVELS AND REDUCE THE THE RISK OF A POSSIBLE SERIOUS MISSION ABORT OR SAFETY HAZARD. THE SCHEDULED MAINTENANCE WILL, ALSO, IDENTIFY THOSE FAILURE MODES THAT REQUIRE DESIGN MODIFICATION. SOURCE OF DATA: - 301.2.4.2.1 (SECONDARY CRITICAL FAILURES) (CRITICAL/CATASTROPHIC FAILURE MODE=SHSC 1,2). (NONCRITICAL HIDDEN FAILURES). - 301.2.4.2.2 (SCHEDULED MAINTENANCE CANDIDATES).
301.2.4.2.3A2	ASSESS AGE /USAGE EFFECT ON FAILURE DETECTION	IDENTIFY WEAROUT TYPE COMPONENTS AND DETERMINE THE FEASIBILITY OF SCHEDULING REPLACEMENT OF THE COMPONENT UNDER ANALYSIS. THIS PROCESS WILL DETERMINE IF THE PROBABILITY OF COMPONENT FAILURE INCREASES WITH AGE (CALENDAR TIME) OR USAGE INDICATORS (OPERATING HOURS, MILES, ROUNDS, CYCLES) INCREASE. FOR THESE ITEMS, A SCHEDULED REMOVAL TIME WILL BE IDENTIFIED AT A POINT IN TIME OR AFTER A SPECIFIED AMOUNT OF USAGE WHEN THE PROBABILITY OF FAILURE INCREASES TO AN UNACCEPTABLE LEVEL. IN THESE CASES, REMOVE AND REPLACEMENT WITh A NEW ITEM WILL RETURN THE PROBABILITY OF FAILURE TO ITS ORIGINAL LEVEL. SOURCE OF DATA: - 301.2.4.2.3A1 (PREDICTABLE FAILURE RATE VS. AGE).
301.2.4.2.3A3	ASSESS LEAD TIME DETECTION TO FAILURE	DETERMINE THE PROBABILITY THAT THE SCHEDULED MAINTENANCE TASK WILL COINCIDE WITH THE TIME BETWEEN THE ONSET OF DEGRADATION AND THE FAILURE SO THE IMPENDING FAILURE WILL BE DETECTED AND CORRECTED BEFORE IT OCCURS. AS AN EXAMPLE, A COMPONENT THAT FAILS WITHIN SECONDS AFTER THE ONSET OF ANY MEASURABLE DEGRADATION WOULD NOT BE A GOOD CANDIDATE FOR A SCHEDULED TASK. THE PROBABILITY THAT ANY REASONABLE INSPECTION INTERVAL WOULD RESULT IN THE INSPECTION OCCURING WITHIN THE TIME BETWEEN ONSET AND FAILURE IS VERY SMALL IN THIS CASE, THUS, THE PAYOFF WOULD BE EXTREMELY SMALL. ON THE OTHER HAND, IF THE TIME BETWEEN MEASURABLE FAILURE ONSET AND ACTUAL FAILURE OCCURENCE WAS MEASURED IN DAYS OR MONTHS, THEN AN INSPECTION INTERVAL COULD BE ESTABLISHED WHICH WOULD RESULT IN A HIGH PROBABILITY OF DETECTING THE FAILURE UNDER ANALYSIS BEFORE IT OCCURS. SOURCE OF DATA: - 301.2.4.2.3A1 (POTENTIAL CREW/MONITOR DETECTABLE IMPEND. FAIL.) (POTENTIAL OPERATOR-DETECTABLE IMPENDING FAIL.)
301.2.4.2.3A4	ASSESS PRO BABILITY OF DETECT BEFORE FAILURE	IDENTIFY THOSE CRITICAL FAILURE MODES WHICH CAN BE DETECTED THROUGH ROUTINE MONITORING WITH SUFFICIENT LEADTIME TO PREVENT A MISSION ABORT OR SAFETY HAZARD. IF THERE IS A HIGH PROBABILITY THAT A FAILURE MODE UNDER ANALYSIS CAN BE DETECTED WITH SUFFICIENT LEADTIME BEFORE IT WILL ACTUALLY OCCUR TO PREVENT A MISSION ABORT OR INCURRENCE OF A SAFETY HAZARD, THEN FURTHER ANALYSIS IS REQUIRED TO IDENTIFY SCHEDULED MAINTENANCE TASKS THAT WILL REDUCE THE RELIABILITY OR SAFETY HAZARD. SOURCE OF DATA: - 301.2.4.2.3A1 (MAINTENANCE DETECTABLE IMPENDING FAILURE).

Name	Label	Description
ACC/CREW/MONIT/IMP/F	ACCEPTABLE CREW/OPERATR MONITORING OF IMPENDING FAILURES	PURPOSE: DATA ON THOSE CRITICAL FAILURE MODES FOR WHICH THERE IS ACCEPTABLE CREW/OPERATOR MONITORING CAPABILITIES OF DETECTING IMPENDING FAILURES. THIS DATA IS TRANFERRED TO THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11. DATA READS AS FOLLOWS: 1. IDENTIFICATION NUMBER. [LCN] (BLOCK 1.) 2. RELIABILITY CENTERED MAINTENANCE LOGIC RESULTS. (BLOCK 5.) SOURCE OF DATA: 301.2.4.2.3A3 (ACCESS LEAD TIME DETECTION TO FAILURE).
CRIT/CATS/FAIL	CRITICAL/ CATASTROP'C FAILURE MODE (SHSC 1, 2)	PURPOSE: A SEVERITY CLASSIFICATION ASSIGNED TO EACH IDENTIFIED FAILURE MODE AND ITEM ANALYZED IN ACCORDANCE WITH THE FOLLOWING SAFETY HAZARD SEVERITY CODES (SHSC 1&2) AS DETAILED IN (MIL-STD-1629A). CATAGORIES: 1. CATASTROPHIC - A FAILURE WHICH MAY CAUSE DEATH OR WEAPON SYSTEM LOSS(i.e.,AIRCRAFT, TANK,MISSILE,SHIP,ETC.). 2. CRITICAL - A FAILURE WHICH MAY CAUSE SEVERE INJURY,MAJOR PROPERTY DAMAGE,OR MAJOR SYSTEM DAMAGE WHICH WILL RESULT IN MISSION LOSS. SOURCE OF DATA: 301.2.4.2.1 (PIECE/PART CRITICALITY ASSESSMENT).
MAINT/DET/IMP/FAIL	MAINTENANCE DETECTIBLE IMPENDING FAILURES	PURPOSE: IMFORMATION FOR IDENTIFYING SPECIFIC FAILURE MODES RESULTING FROM SCHEDULED MAINTENANCE TASKS. IMPENDING FAILURE MUST BE DETECTABLE EITHER BY VISUAL INSPECTION OR THROUGH USE OF TEST/MEASUREMENT EQUIPTMENT. DATA SOURCE: 301.2.4.2.3A1 (IMPENDING FAILURE DETECTION ASSESSMENT RESULTS.)
NONCRIT/HID/FAIL	NONCRITICAL HIDDEN FAILURES	PURPOSE: NONCRITICAL FAILURES IDENTIFIED BY THE FOLLOWING SAFTEY HAZARD SEVERITY CODES AS DESCRIBED IN (MIL-STD-1629A). A. CATEGORY III - MARGINAL - A FAILURE WHICH MAY CAUSE MINOR INJURY,MINOR PROPERTY DAMAGE,OR MINOR SYSTEM DAMAGE WHICH WILL RESULT IN DELAY OR LOSS OF AVAILABILITY OR MISSION DEGRADATION. B. CATEGORY IV - MINOR - A FAILURE NOT SERIOUS ENOUGH TO CAUSE INJURY,PROPERTY DAMAGE,OR SYSTEM DAMAGE,BUT WHICH WILL RESULT IN UNSCHEDULED MAINTENANCE OR REPAIR. SOURCE OF DATA: FMECA (MIL-STD-1629A). 301.2.4.2.1A3 (EVALUATE EFFECT OF SECONDARY FAILURE).
POT/CREW/DETECT/IMP/	POTENTIAL CREW/OPERATR DETECTABLE IMPENDING FAILURES	PURPOSE: IMFORMATION ON THOSE CRITICAL FAILURE MODES WHICH CAN BE DETECTED THROUGH ROUTINE CREW/OPERATOR MONITORING WITH SUFFICIENT LEADTIME TO PREVENT SAFTY HAZARD OR MISSION ABORT. SOURCE OF DATA: 301.2.4.2.3A1 (IMPENDING FAILURE DETECTION ASSESSMENT RESULTS.)

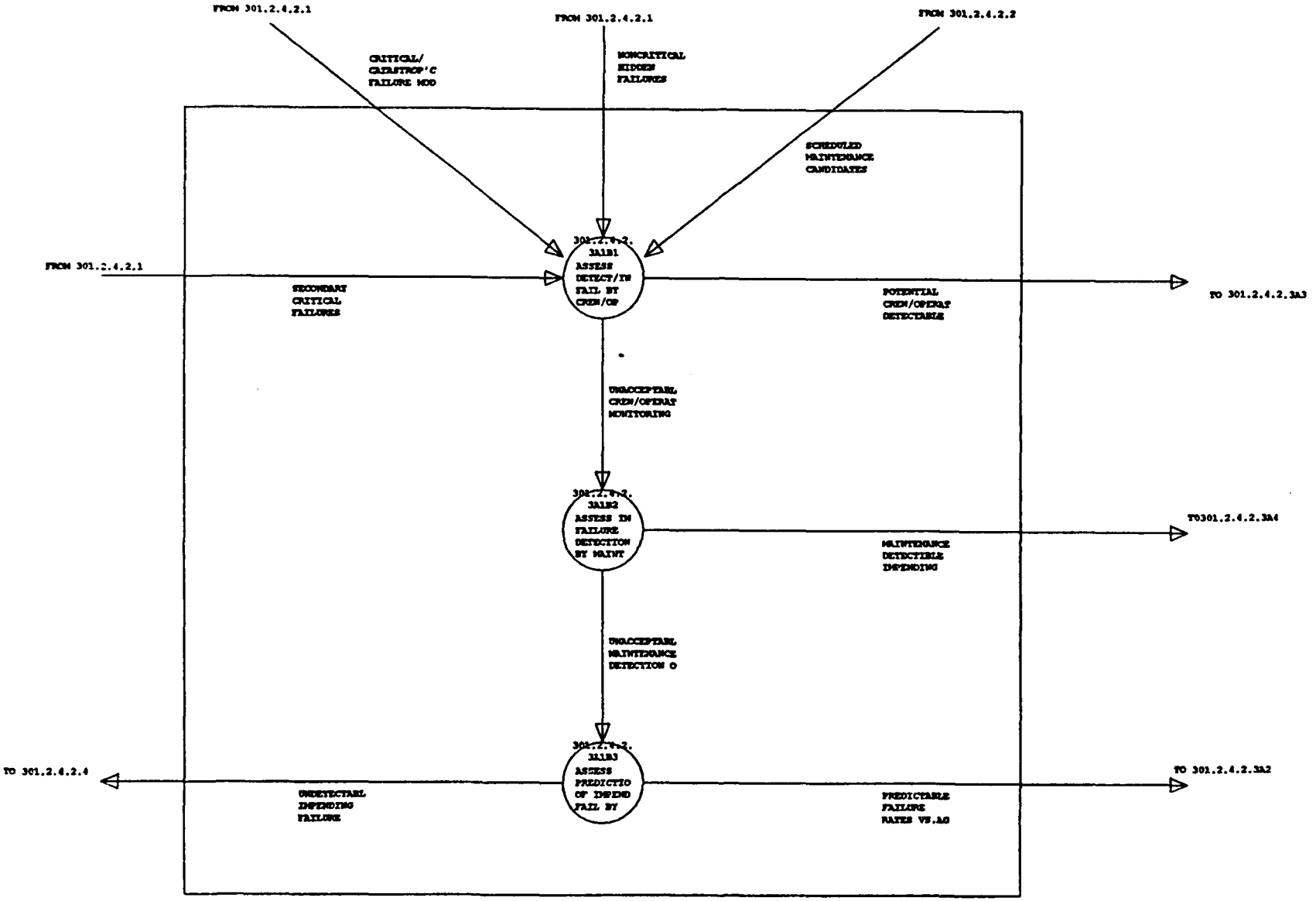
Name	Label	Description
PRED/FAIL/RT/AGE	PREDICTABLE FAILURE RATES VS.AGE	PURPOSE: DATA FOR DETERMINING THE PROBABILITY OF COMPONENT FAILURE AS A FUNCTION OF CALENDER TIME OR USAGE. SOURCE OF DATA: 301.2.4.2.3A1 (IMPENDING FAILURE DETECTION ASSESSMENT).
PRED/IMP/FAIL	PREDICTIBLE IMPENDING FAILURE-AGE RELATED	PURPOSE: IMFORMATION ON KNOWN INCIPIENT FAILURE INDICATORS (e.g., OPERATIONAL PERFORMANCE VARIATIONS) WHICH ARE PRECULIAR TO THE ITEM FAILURE TRENDS OVER A SPECIFIED PERIOD OF TIME (CALENDER DAYS). SOURCE OF DATA: 301.2.4.2.3 (IMPENDING FAILURE DETECTION ASSESSMENT)
PROB/DET/MAINT	PROBABILITY OF DETECTION -MAINTENANCE	PURPOSE: A COLLECTION OF DATA WHERE MEASURED VALUES ARE APPLIED FOR DETERMINING THE PROBABILITY OF DETECTING A IMPENDING FAILURE,AND USED IN ACCESSING MAINTENANCE REQUIREMENTS. THIS DATA IS TRANFERRED TO THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11. DATA READS AS FOLLOWS: 1. IDENTIFICATION NUMBER. (BLOCK 1) 2. RELIABILITY CENTERED MAINTENANCE LOGIC RESULTS. (BLOCK 5). SOURCE OF DATA: 301.2.4.2.3 (IMPENDING FAILURE DETECTION ASSESSMENT).
SCH/MAINT/CAND	SCHEDULED MAINTENANCE CANDIDATES	PURPOSE: SUPPLIED DATA ON THOSE CANDIDATES OF WHICH THEIR PROBABILITY FAILURE HAS BEEN MEASURED AND SCHEDULED MAINTENANCE HAS BEEN DETERMINED TO BE ECONOMICALLY JUSTIFIABLE IN ACCORDANCE TO THE RCM LOGIC PROCESS DESCRIBED IN (AMC-P-750-2). SOURCE OF DATA: 301.2.4.2.2 (ECONOMIC ASSESSMENT OF SCH. VS .UNSCH. MAINTENANCE).

Name	Label	Description
SEC/CRIT/FAIL	SECONDARY CRITICAL FAILURES	PURPOSE: THOSE FAILURE MODES INITIALLY CLASSIFIED AS NONCRITICAL WHICH IN TURN,EXPERIENCES A SECONDARY FAILURE CLASSIFIED AS CRITICAL. THIS FAILURE MODE RESULTS IN EITHER A SAFETY HAZARD OR MISSION ABORT. SAFETY HAZARD SEVERITY CODES: A. CATEGORY I - CATASTROPHIC - A FAILURE WHICH MAY CAUSE DEATH OR WEAPON SYSTEM LOSS (i.e.,AIRCRAFT,TANK,MISSLE, SHIP,ETC.). B. CATEGORY II - CRITICAL - A FAILURE WHICH MAY CAUSE SEVERE INJURY,MAJOR PROPERTY DAMAGE,OR MAJOR SYSTEM DAMAGE WHICH WILL RESULT IN MISSION LOSS. C. CATEGORY III - MARGINAL - A FAILURE WHICH MAY CAUSE MINOR INJURY,MINOR PROPERTY DAMAGE,OR MINOR SYSTEM DAMAGE WHICH WILL RESULT IN DELAY OR LOSS OF AVAILABILITY OR MISSION DEGRAADATION. D. CATEGORY IV - MINOR - A FAILURE NOT SERIOUS ENOUGH TO CAUSE INJURY,PROPERTY DAMAGE, OR SYSTEM DAMAGE, BUT WHICH WILL RESULT IN UNSCHEDULED MAINTENANCE OR REPAIR. THISE FAILURE MODE HAS TO BE ANALYZED FURTHER TO DETERMINE WHAT SCHEDULED MAINTENANCE TASKS CAN BE PERFORMED IN ORDER TO PREVENT OR DECREASE THE LIKELIHOOD THAT RELIABILITY WILL NOT FALL WITHIN ACCEPTABLE LEVELS. SOURCE OF DATA: 301.2.4.2.1 (PIECE/PART CRITICALITY ASSESSMENT). FMECA ANALYSIS (MIL-STD-1629A)
UNDET/IMP/FAIL	UNDETECTABLE IMPENDING FAILURE	PURPOSE: DATA CONTAINING THOSE COMPONENTS WHOSE FAILURE MODE IS CRITICAL /HIDDEN AND THERE ARE NO MEANS OF DETECTION FOR PREVENTING OR REDUCING THE PROBABILITY OF OCCURRENCE. SOURCE OF DATA: 301.2.4.2.3 (RESULTS FROM IMPENDING FAILURE DETECTION ASSESSMENT).

Name	Label	Description
Y/B/B11/5A/5	Y-RCRD B CARD# B11 BLCK 5A COLMN 5	ACRONYMS: LSAR - LOGISTICS SUPPORT ANALYSIS REPORT. THIS ENTITY REFERS TO THE LSAR LOCATION RECORD B CARD B11 BLOCD 5A. IT CONTAINS ALL THE COLUMNS ASSOCIATED WITH THE THE CARD.
Y/B/B11/5A/6	Y-RCRD B CARD# B11 BLCK 5A COLMN 6	ACRONYMS: LSAR - LOGISTICS SUPPORT ANALYSIS RECORD. THIS ENTITY REFERS TO A LOCATION RECORD B CARD B11 BLOCK 5A. IT CONTAINS ALL THE COLUMNS ASSOCIATED WITH THE CARD.

301.2.4.2.3A1B

IMPENDING FAILURE DETECTION ANALYSIS



301.2.4.2.3A1B
Created by: JMC
Revised by: jmc
Date changed: 19-AUG-88

Name	Label	Description
301.2.4.2.3A1B1	ASSESS DETECT/INP FAIL BY CREW/OP MONITORING	PURPOSE: IDENTIFY THOSE CRITICAL FAILURE MODES WHICH CAN BE DETECTED THROUGH ROUTINE CREW/OPERATOR MONITORING WITH SUFFICIENT LEADTIME TO PREVENT A MISSION ABORT OR SAFETY HAZARD. DETECTION MEANS CAN BE IN THE FORM OF INSTRUMENTATION (GAUGES,WARNING LIGHTS,ETC. OR OPERATIONAL CHARACTERISTICS (VIBRATION,SOUND,ETC.). SOURCE OF DATA: - 301.2.4.2.1 (SECONDARY CRITICAL FAILURES) (CRITICAL/CATASTROPHIC FAILURE MODE SHSC 1,2). (NONCRITICAL HIDDEN FAILURES). - 301.2.4.2.2 (SCHEDULED MAINTENANCE CANDIDATES)
301.2.4.2.3A1B2	ASSESS IMP FAILURE DETECTION BY MAINT	IDENTIFY THOSE COMPONENTS OF WHICH AN EFFECIENT SCHEDULED MAINTENANCE TASK CAN BE APPLIED. THE IMPENDING FAILURE MUST BE PHYSICALLY DETECTABLE EITHER BY VISUAL INSPECTION,THROUGH USE OF TEST OR MEASUREMENT EQUIPMENT. INORDER FOR A COMPONENT TO BE DETECTABLE,ITS MEASURABLE PHYSICAL PROPERTIES MUST CHANGE WITH THE ONSET OF DEGRADATION TO ALLOW IDENTIFICATION OF IMPENDING FAILURE THROUGH COMPARISION WITH NORMAL PROPERTIES. WHEN DEVELOPING SCHEDULED MAINTENANCE TASKS,THERE MUST BE A HIGH PROBABILITY OF DETECTING THE FAILURE UNDER ANALYSIS BEFORE IT OCCURS. SOURCE OF DATA: - 301.2.4.2.3A1B1 (*UNACCEPTABLE CREW/MONITORING OF IMPENDING FAIL.*)
301.2.4.2.3A1B3	ASSESS PREDICTION OF IMPEND FAIL BY AGE/USAGE	IDENTIFY THOSE WEAROUT TYPE COMPONENTS AND DETERMINE THE FEASIBILITY OF SCHEDULING REPLACEMENT OF THE COMPONENT UNDER ANALYSIS. A SCHEDULED REMOVAL WILL BE IDENTIFIED AT A POINT IN TIME OR AFTER A SPECIFIED AMOUNT OF USAGE WHEN THE PROBABILITY OF FAILURE INCREASES TO AN UNACCEPTABLE LEVEL, REMOVAL AND REPLACEMENT WITH A NEW ITEM WILL RETURN THE PROBABILITY OF FAILURE TO ITS ORIGINAL LEVEL. SOURCE OF DATA:-301.2.4.2.3A1B2 (UNACCEPTABLE MAINTENANCE DETECTION OF IMPEND. FAIL.)

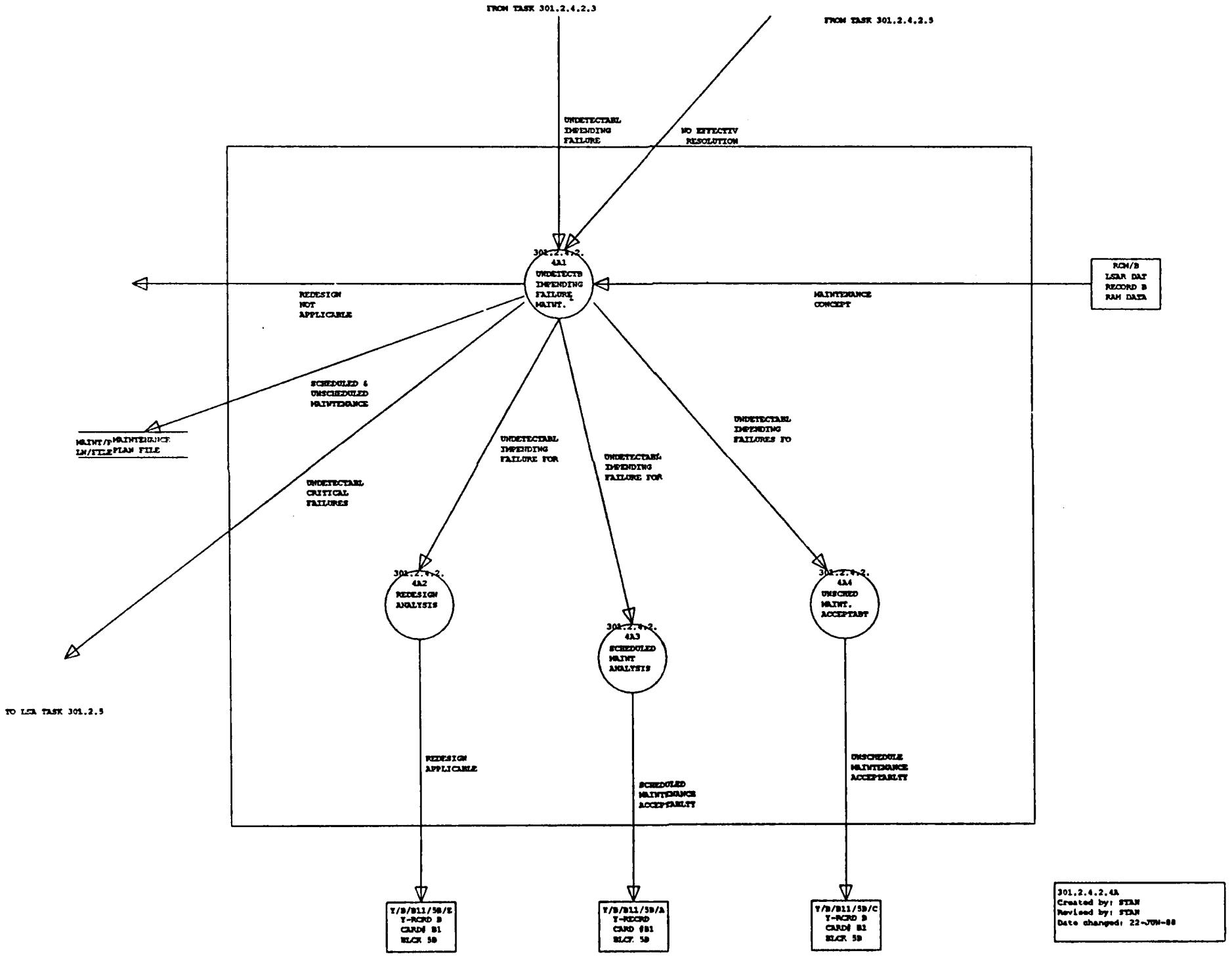
Name	Label	Description
CRIT/CATS/FAIL	CRITICAL/ CATASTROP'C FAILURE MODE (SHSC 1, 2)	PURPOSE: A SEVERITY CLASSIFICATION ASSIGNED TO EACH IDENTIFIED FAILURE MODE AND ITEM ANALYZED IN ACCORDANCE WITH THE FOLLOWING SAFETY HAZARD SEVERITY CODES (SHSC 1&2) AS DETAILED IN (MIL-STD-1629A). CATAGORIES: 1. CATASTROPHIC - A FAILURE WHICH MAY CAUSE DEATH OR WEAPON SYSTEM LOSS(i.e.,AIRCRAFT, TANK,MISSILE,SHIP,ETC.). 2. CRITICAL - A FAILURE WHICH MAY CAUSE SEVERE INJURY,MAJOR PROPERTY DAMAGE,OR MAJOR SYSTEM DAMAGE WHICH WILL RESULT IN MISSION LOSS. SOURCE OF DATA: 301.2.4.2.1 (PIECE/PART CRITICALITY ASSESSMENT).
MAINT/DET/IMP/FAIL	MAINTENANCE DETECTIBLE IMPENDING FAILURES	PURPOSE: IMFORMATION FOR IDENTIFYING SPECIFIC FAILURE MODES RESULTING FROM SCHEDULED MAINTENANCE TASKS. IMPENDING FAILURE MUST BE DETECTABLE EITHER BY VISUAL INSPECTION OR THROUGH USE OF TEST/MEASUREMENT EQUIPTMENT. DATA SOURCE: 301.2.4.2.3A1 (IMPENDING FAILURE DETECTION ASSESSMENT RESULTS.)
NONCRIT/HID/FAIL	NONCRITICAL HIDDEN FAILURES	PURPOSE: NONCRITICAL FAILURES IDENTIFIED BY THE FOLLOWING SAFTEY HAZARD SEVERITY CODES AS DESCRIBED IN (MIL-STD-1629A). A. CATEGORY III - MARGINAL - A FAILURE WHICH MAY CAUSE MINOR INJURY,MINOR PROPERTY DAMAGE,OR MINOR SYSTEM DAMAGE WHICH WILL RESULT IN DELAY OR LOSS OF AVAILABILITY OR MISSION DEGRADATION. B. CATEGORY IV - MINOR - A FAILURE NOT SERIOUS ENOUGH TO CAUSE INJURY,PROPERTY DAMAGE,OR SYSTEM DAMAGE,BUT WHICH WILL RESULT IN UNSCHEDULED MAINTENANCE OR REPAIR. SOURCE OF DATA: FMECA (MIL-STD-1629A). 301.2.4.2.1A3 (EVALUATE EFFECT OF SECONDARY FAILURE).
POT/CREW/DETECT/IMP/	POTENTIAL CREW/OPERATR DETECTABLE IMPENDING FAILURES	PURPOSE: IMFORMATION ON THOSE CRITICAL FAILURE MODES WHICH CAN BE DETECTED THROUGH ROUTINE CREW/OPERATOR MONITORING WITH SUFFICIENT LEADTIME TO PREVENT SAFTY HAZARD OR MISSION ABORT. SOURCE OF DATA: 301.2.4.2.3A1 (IMPENDING FAILURE DETECTION ASSESSMENT RESULTS.)
PRED/FAIL/RT/AGE	PREDICTABLE FAILURE RATES VS.AGE	PURPOSE: DATA FOR DETERMINING THE PROBABILITY OF COMPONENT FAILURE AS A FUNCTION OF CALENDER TIME OR USAGE. SOURCE OF DATA: 301.2.4.2.3A1 (IMPENDING FAILURE DETECTION ASSESSMENT).

Name	Label	Description
SCH/MAINT/CAND	SCHEDULED MAINTENANCE CANDIDATES	PURPOSE: SUPPLIED DATA ON THOSE CANDIDATES OF WHICH THEIR PROBABILITY FAILURE HAS BEEN MEASURED AND SCHEDULED MAINTENANCE HAS BEEN DETERMINED TO BE ECONOMICALLY JUSTIFIABLE IN ACCORDANCE TO THE RCM LOGIC PROCESS DESCRIBED IN (AMC-P-750-2). SOURCE OF DATA: 301.2.4.2.2 (ECONOMIC ASSESSMENT OF SCH. VS .UNSCH. MAINTENANCE).
SEC/CRIT/FAIL	SECONDARY CRITICAL FAILURES	PURPOSE: THOSE FAILURE MODES INITIALLY CLASSIFIED AS NONCRITICAL WHICH IN TURN,EXPERIENCES A SECONDARY FAILURE CLASSIFIED AS CRITICAL. THIS FAILURE MODE RESULTS IN EITHER A SAFETY HAZARD OR MISSION ABORT. SAFETY HAZARD SEVERITY CODES: A. CATEGORY I - CATASTROPHIC - A FAILURE WHICH MAY CAUSE DEATH OR WEAPON SYSTEM LOSS (i.e.,AIRCRAFT,TANK,MISSLE, SHIP,ETC.). B. CATEGORY II - CRITICAL - A FAILURE WHICH MAY CAUSE SEVERE INJURY,MAJOR PROPERTY DAMAGE,OR MAJOR SYSTEM DAMAGE WHICH WILL RESULT IN MISSION LOSS. C. CATEGORY III - MARGINAL - A FAILURE WHICH MAY CAUSE MINOR INJURY,MINOR PROPERTY DAMAGE,OR MINOR SYSTEM DAMAGE WHICH WILL RESULT IN DELAY OR LOSS OF AVAILABILITY OR MISSION DEGRAADATION. D. CATEGORY IV - MINOR - A FAILURE NOT SERIOUS ENOUGH TO CAUSE INJURY,PROPERTY DAMAGE, OR SYSTEM DAMAGE, BUT WHICH WILL RESULT IN UNSCHEDULED MAINTENANCE OR REPAIR. THISE FAILURE MODE HAS TO BE ANALYZED FURTHER TO DETERMINE WHAT SCHEDULED MAINTENANCE TASKS CAN BE PERFORMED IN ORDER TO PREVENT OR DECREASE THE LIKELIHOOD THAT RELIABILITY WILL NOT FALL WITHIN ACCEPTABLE LEVELS. SOURCE OF DATA: 301.2.4.2.1 (PIECE/PART CRITICALITY ASSESSMENT). FMECA ANALYSIS (MIL-STD-1629A)
UNACC/CREW/MONIT/IMP	UNACCEPTABLE CREW/OPERATR MONITORING OF IMPENDING FAILURES	PURPOSE: TO PROVIDE THE ANALYSIS WITH DATA PERTAINING TO THOSE IMPENDING FAILURES THAT CANNOT BE DETECTABLE BY OPERATOR/CREW WITH THE USE OF GUAGES,WARNING LIGHTS ETC. OR BY OPERATIONAL CHARACTERISTICS (VIBRATION,SOUND,ETC.). FURTHERU FUATION OF IMPENDING SOURCE OF DATA: 301.2.4.2.3A1B1 (ASSESS/DETECTION OF IMPENDING FAILURES BY OPERATOR/CREW MONITORING)
UNACC/MAINT/DETECT/I	UNACCEPTABLE MAINTENANCE DETECTION OF IMPENDING FAILURES	PURPOSE: TO PROVIDE THE ANALYSIS WITH DATA PERTAINING TO THOSE FAILURES THAT ARE NOT DETECTABLE BY MEASURABLE PHYSICAL PROPERTIES OF THE COMPONENT. THERE IS NO MEANS OF COMPARING IDENTIFIED IMPENDING FAILURES WITH NORMAL PROPERTIES OF THE COMPONENT. ANALYZING THE PREDICTABILITY OF AN IMPENDING FAILURE BY USAGE/AGE MUST BE CONSIDERED. SOURCE OF DATA: 301.2.4.2.3A1B2 (ASSESS/IMPENDING FAILURE DETECTION BY MAINTENANCE).

Name	Label	Description
UNDET/IMP/FAIL	UNDETECTABLE IMPENDING FAILURE	PURPOSE: DATA CONTAINING THOSE COMPONENTS WHOSE FAILURE MODE IS CRITICAL /HIDDEN AND THERE ARE NO MEANS OF DETECTION FOR PREVENTING OR REDUCING THE PROBABILITY OF OCCURRENCE. SOURCE OF DATA: 301.2.4.2.3 (RESULTS FROM IMPENDING FAILURE DETECTION ASSESSMENT).

301.2.4.2.4A

UNDETECTED IMPENDING FAILURE ANALYSIS


FROM TASK 301.2.4.2.3
FROM TASK 301.2.4.2.5
UNDETECTABL IMPENDING FAILURE
NO EFFECTIV RESOLUTION
301.2.4.2. 4A1 UNDETECTB IMPENDING FAILURE MAINT.
RCM/B LSAR DAT RECORD B RAM DATA
REDESIGN NOT APPLICABLE
MAINTENANCE CONCEPT
SCHEDULED & UNSCHEDULED MAINTENANCE
MAINT/P LN/FILE
MAINTENANCE PLAN FILE
UNDETECTABL CRITICAL FAILURES
UNDETECTABL IMPENDING FAILURE FOR
UNDETECTABL IMPENDING FAILURE FOR
UNDETECTABL IMPENDING FAILURES FO
301.2.4.2. 4A2 REDESIGN ANALYSIS
301.2.4.2. 4A3 SCHEDULED MAINT ANALYSIS
301.2.4.2. 4A4 UNSCHED MAINT. ACCEPTABT
TO LSA TASK 301.2.5
REDESIGN APPLICABLE
SCHEDULED MAINTENANCE ACCEPTABLTY
UNSCHEDULE MAINTENANCE ACCEPTABLTY
T/B/B11/5B/E T-RCRD B CARD# B1 BLCK 5B
T/B/B11/5B/A T-RECRD CARD #B1 BLCK 5B
T/B/B11/5B/C T-RCRD B CARD# B1 BLCK 5B
301.2.4.2.4A
Created by: STAN
Revised by: STAN
Date changed: 22-JUN-88

Name	Label	Description
301.2.4.2.4A1	UNDETECTBL IMPENDING FAILURE MAINT. ANALYSIS	ANALYZE THOSE IDENTIFIED UNDETECTABLE IMPENDING FAILURE AND SELECT A MAINTENANCE PROGRAM FOR EACH FAILURE TO ENSURE THAT IT WILL MEET THE REQUIRED MISSION AND SAFETY LEVELS. IF NO MAINTENANCE TASK MEETS THE REQUIREMENTS,REDESIGN SHOULD BE CONSIDERED A VIABLE ALTERNATIVE. SOURCE OF DATA: - 301.2.4.2.3 (UNDETECTABLE IMPENDING FAILURE). - 301.2.4.2.5 (NO EFFECTIVE RESOLUTION). - LSAR RECORD/B (MAINTENANCE CONCEPT).
301.2.4.2.4A2	REDESIGN ANALYSIS	EVALUATE THOSE UNDETECTABLE FAILURES FOR WHICH NO APPROPRIATE MAINTENANCE TASK SATISFIES THEIR REQUIREMENTS. THE COST AND FEASIBILITY OF A REDESIGN IS REVIEWED ALONG WITH THE POTENTIAL BENEFITS DERIVED FROM REDESIGN. IF REDESIGN IS PROVEN TO BE ECONOMICALLY AND TECHNICALLY JUSTIFIED,IT IS CONSIDERED A VIABLE ALTERNATIVE. SOURCE OF DATA:
301.2.4.2.4A3	SCHEDULED MAINT ANALYSIS	EVALUATE THOSE IDENTIFIED UNDETECTABLE FAILURES WHOSE FAILURE CHARACTERISTICS REQUIRES SCHEDULED MAINTENANCE AS PREVENTIVE MAINTENANCE PROCEDURE. SCHEDULED INSPECTIONS SHOULD LOCATE IMMINENT FAILURES AND DETECT THE OCCURRENCE OF THE FAILURE. THE REPLACEMENT INTERVALS ESTABLISHED MUST FALL WITHIN THE ANTICIPATED SERVICE LIFE OF THE SYSTEM. ECONOMIC JUSTIFICATION MUST BE DETERMINED. THE DIFFERENCE IN OWNERSHIP COST FOR THE END ITEM MUST BE CALCULATED. SOURCE OF DATA: - 301.2.4.2.4A3
301.2.4.2.4A4	UNSCHED MAINT. ACCEPTABTY	EVALUATE THOSE UNDETECTABLE FAILURES DETERMINED TO BE ACCEPTABLE FOR UNSCHEDULED MAINTENANCE. THE FAILURE MUST BE DETERMINED NOT CAUSE A SAFETY HAZARD,BUT RATHER CAUSES MISSION FAILURE. IF THE FAILURE OR EFFECTS OF THE FAILURE CAN BE TOLERATED,PROMPT CORRECTIVE ACTION MUST BE ENSURED. SOURCE OF DATA: - 301.2.4.2.4A1

Name	Label	Description
MAINT/CNCPT	MAINTENANCE CONCEPT	PURPOSE: THE BROAD,PLANNED APPROACH TO BE EMPLOYED SUSTAINING THE SYSTEM/EQUIPMENT IN A SPECIFIED CONDITION IN SUPPORT OF THE OPERATIONAL REQUIREMENT. PROVIDES THE BASIS FOR MAINTENANCE PLAN. MAINTENANCE PLAN GUIDELINES PERTAIN TO: 1. MAINTENANCE TASKS. 2. LEVELS. 3. LOCATIONS: A. ORGANIC/CONTRACTOR MAINTENANCE WORKLOAD MIX. B. CONDITION MONTORING C. FAULT ISOLATION AND TESTING APPROACH. D. COMPATIBILITY WITH EXISTING SUPPORT/TEST EQUIPMENT ETC. SOURCE OF DATA: LOGISTICS SUPPORT ANALYSIS REPORT (LSAR) RECORD B,CARD B10 BLOCK 4.
NO/EFF/RESLTN	NO EFFECTIVE RESOLUTION	PURPOSE: IDENTIFY THOSE COMPONENT FAILURES THAT CANNOT BE DETECTED BY: 1. INSTRUMENTS (GUAGES,WARNING LIGHTS,ETC.) 2. OPERATIONAL CHARACTERISTICS (VIBRATION,SOUND ETC.) IF FAILURE AGREES WITH ITEMS 1.& 2.,AN UNDETECTABLE FAILURE ANALYSIS MUST BE INVESTIGATED. SOURCE OF DATA: 301.2.4.2.5 (IMPENDING FAILURE DETECTION ASSESSMENT.)
REDSGN/APP	REDESIGN APPLICABLE	PURPOSE: REQUIRED REDESIGN DATA TO BE TRANSFERRED TO ITS APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11. THIS CARD READS AS FOLLOWS: 1. IDENTIFICATION NUMBER [LCN] (BLOCK 1). 2. DISPOSITION (BLOCK 5) SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).
REDSGN/NOT APP	REDESIGN NOT APPLICABLE	PURPOSE: THOSE COMPONENTS FOR WHICH THE COST OF REDESIGN MAY BE PROHIBITIVE OR THE INCORPORATION OF A REDESIGN MAY NOT BE TECHNICALLY FEASIBLE. THESE ITEMS MUST BE RE-EVALUATED THROUGH THE RCM PROCESS IN ACCORDANCE WITH AMC-P-750-2. SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).
SCH/MAINT/ACC	SCHEDULED MAINTENANCE ACCEPTABLTY	PURPOSE: TRANSFERS ACCEPTABLE SCHEDULED MAINTENANCE DATA TO THE APPROPRIATE LSAR BLOCK LOCATION CARD B11. THIS DATA READS AS FOLLOWS: 1. IDENTIFICATION NUMBER [LCN] (BLOCK 1). 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).
SCH/MAINT/COST/EFT R	SCHEDULED MAINTENANCE COST/EFFECT REVIEW	PURPOSE: THOSE UNDETECTABLE IMPENDING FAILURES THAT REQUIRE A COST/EFFECTIVE REVIEW PRIOR TO ASSIGNING A SCHEDULED MAINTENANCE TASK. SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).

Name	Label	Description
SCH/UNSCH/MAINT/FUNC	SCHEDULED & UNSCHEDULED MAINTENANCE FUNCTIONS	PURPOSE: DESCRIBES THE ESSENTIAL FUNCTIONS REQUIRED FOR EXECUTING THE APPLICATION OF SCHEDULED OR UNSCHEDULED MAINTENANCE PLANS. THE FUNCTIONS ARE LISTED AS FOLLOWS: 1. DETECTABILITY 2. PROBILITY OF OCCURRENCE 3. RATE OF FAILURE 4. COST EFFECTIVENESS SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).
UND/CRIT/FAIL	UNDETECTABLE CRITICAL FAILURES	PURPOSE: CANDIDATE UNDETECTABLE CRITICAL FAILURES OF WHICH WOULD NOT BE DETECTED DURING ROUTINE SCHEDULED OR UNSCHEDULED MAINTENANCE. REDESIGN ALTERNATIVES TO BE INVESTIGATED. SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS).
UNDET/IMP/FAIL	UNDETECTABLE IMPENDING FAILURE	PURPOSE: DATA CONTAINING THOSE COMPONENTS WHOSE FAILURE MODE IS CRITICAL /HIDDEN AND THERE ARE NO MEANS OF DETECTION FOR PREVENTING OR REDUCING THE PROBABILITY OF OCCURRENCE. SOURCE OF DATA: 301.2.4.2.3 (RESULTS FROM IMPENDING FAILURE DETECTION ASSESSMENT).
UNDET/IMP/REDSGN	UNDETECTABLE IMPENDING FAILURE FOR REDESIGN	PURPOSE: DATA IDENTIFIES THOSE UNDETECTABLE IMPENDING FAILURES THAT INDICATES THE RISK OF INCURRING A MISSION ABORT OR SAFETY HAZARD OR HIDDEN FAILURES WOULD BE UNACCEPTABLE. SCHEDULED AND UNSCHEDULED MAINTENANCE TASKS ARE FOUND TO BE UNACCEPTABLE. THEREFOR, THE ONLY ALTERNATIVE IS TO REDESIGN THE COMPONENT. SOURCE OF DATA: 301.2.4.2.4A1 (UNDETECTABLE IMPENDING FAILURE MAINTENANCE ANALYSIS)
UNDET/IMP/SCH/MAINT	UNDETECTABLE IMPENDING FAILURE FOR SCHEDULED MAINTENANCE	PURPOSE: DATA IDENTIFIES THOSE UNDETECTABLE IMPENDING FAILURES FOR WHICH A SCHEDULED MAINTENANCE TASK IS REQUIRED. THE COMPONENTS ARE APPLICABLE TO THE FOLLOWING CONDITIONS: 1. IT MUST BE POSSIBLE TO DEFINE A POTENTIAL FAILURE CONDITION THAT CAN BE DETECTED BY AN EXPLICIT TASK. 2. THERE MUST BE A REASONABLY CONSISTENT AGE INTERVAL BETWEEN THE TIME OF POTENTIAL FAILURE AND THE TIME FOR FUNCTIONAL FAILURE. SOURCE OF DATA: 301.2.4.2.4A1 (UNDETECTABLE IMPENDING FAILURE MAINTENANCE ANALYSIS).

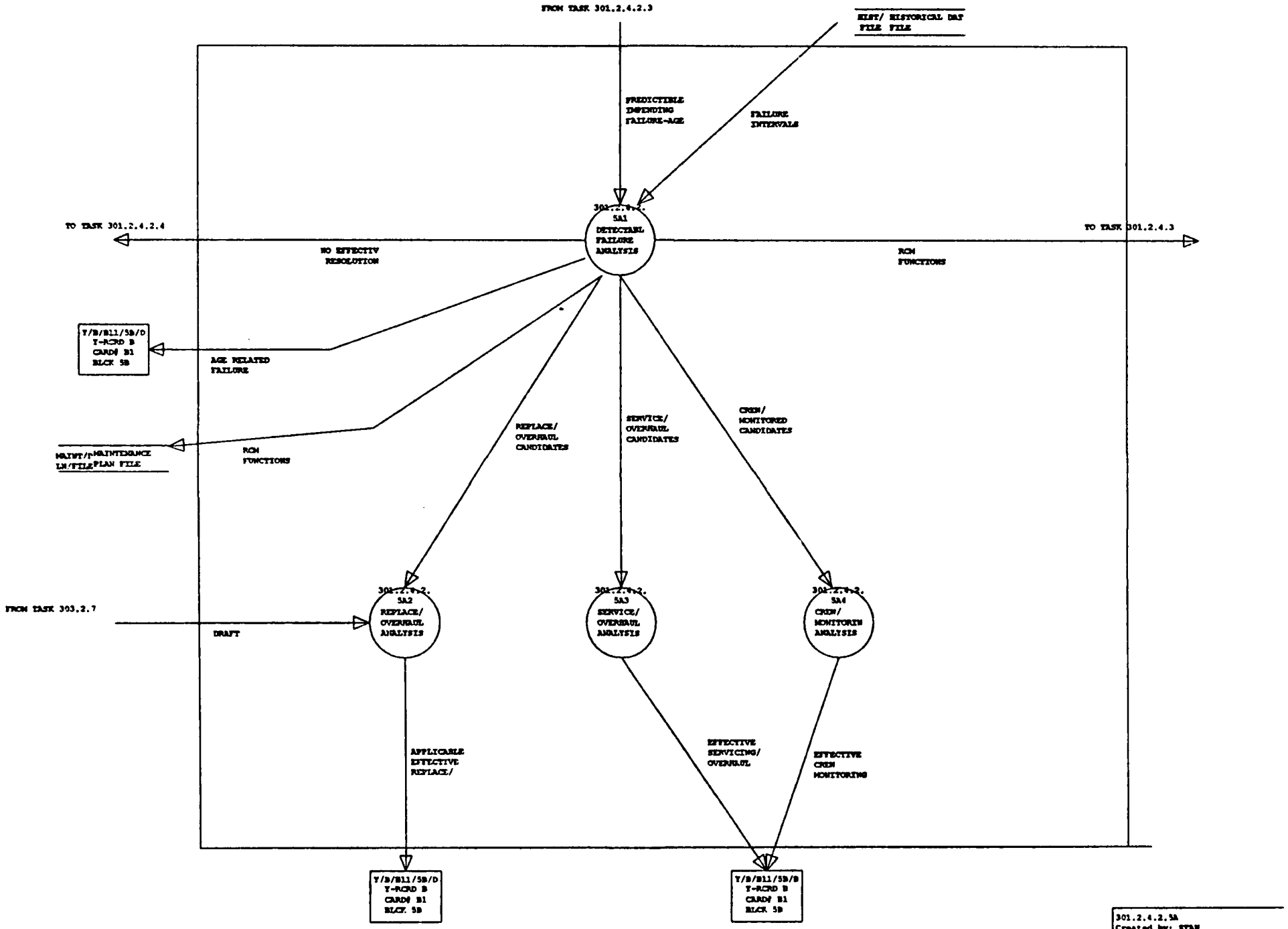
Name	Label	Description
UNDET/IMP/UNSCH/MAIN	UNDETECTABLE IMPENDING FAILURES FOR UNSCHEDULED MAINTENANCE	PURPOSE: DATA IDENTIFIES THOSE UNDETECTABLE IMPENDING FAILURES FOR WHICH AN SCHEDULED MAINTENANCE TASK IS REQUIRED. THE COMPONENTS ARE APPLICABLE TO THE FOLLOWING CONDITIONS: 1. ACTUAL FAILURES ARE DETECTABLE BY THE OPERATOR/CREW EITHER AT THE TIME OF OCCURRENCE OR AFTER OCCURRENCE SO THAT UNSCHEDULED MAINTENANCE CAN BE ACCOMPLISHED IN THE EVENT OF FAILURE. 2. THE FAILURE OR EFFECTS OF THE FAILURE MUST BE TOLERATED. 3. THE FAILURE MUST NOT CAUSE A SAFETY HAZARD, BUT RATHER CAUSE MISSION FAILURE. SOURCE OF DATA: 301.2.4.2.4A1 (UNDETECTABLE IMPENDING FAILURE MAINTENANCE ANALYSIS).
UNS/MAINT/ACC	UNSCHEDULE MAINTENANCE ACCEPTABLTY	PURPOSE: THIS DATA FLOW IS TO AID THE ANALYSIS IN IDENTIFYING COMPONENTS THAT HAVE NONCRITICAL HIDDEN FAILURE MODES WITH NO MEANS OF DETECTING IMPENDING FAILURES OR REDUCING THE THE PROBABILITY OF OCCURRENCE. THIS DATA ,ALSO,EXPLAINS THE RISK OF INCURRING A MISSION ABORT OR SAFTY HAZARD WHICH IS UNACCEPTABLE. DATA IS RECORDED IN THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11. 1. IDENTIFICATION NUMBER. [LCN] (BLOCK 1) 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.4 (UNDETECTABLE IMPENDING FAILURE ANALYSIS). FMECA ANALYSIS.

Name	Label	Description
MAINT/PLN/FILE	MAINTENANCE PLAN FILE	THE MAINTENANCE PLAN AS REQUIRED BY THE ILSP AND DEFINED BY: DI-S-1823 DI-L-25620C DI-R-7111 DI-A-5210 MIL-STD 470A NORMALLY PREPARED BY THE SYSTEM/EQUIPMENT DEVELOPMENT CONTRACTOR AND SUBMITTED TO THE ACQUIRING ACTIVITY AND/OR THE PROGRAM MANAGER FOR REVIEW/APPROVAL. THIS FILE ALSO CONTAINS, AS APPROPRIATE, THE OUTPUT FROM: SUBTASK 301.2.4.2.2, THE RESULTS OF THE ECONOMIC EVALUATION OF THE SCHEDULED VS UNSCHEDULED MAINTENANCE ASSESSMENTS. SUBTASK 301.2.4.2.4, THE EVALUATION OF UNDETECTABLE IMPENDING FAILURES SUBTASK 301.2.4.2.5, THE EVALUATION OF THE DETECTABLE FAILURES

Name	Label	Description
Y/B/B11/5B/A	Y-RECRD B CARD #B11 BLCK 5B COLMN A	ACRONYMS: LSAR - LOGISTICS SUPPORT ANALYSIS RECORD. THIS ENTITY REFERS TO THE LSAR LOCATION RECORD B CARD B11 BLOCK 5B. IT CONTAINS ALL COLUMNS ASSOCIATED WITH THE CARD.
Y/B/B11/5B/C	Y-RCRD B CARD# B11 BLCK 5B COLMN C	ACRONYMS: LSAR - LOGISTIC SUPPORT ANALYSIS RECORD THIS ENTITY REFERS TO LSAR RECORD B CARD B11. IT CONTAINS ALL COLUMNS WITHIN THAT CARD.
Y/B/B11/5B/E	Y-RCRD B CARD# B11 BLCK 5B COLNM E	ACRONYMS: LSAR - LOGISTICS SUPPORT ANALYSIS RECORD THIS ENTITY REFERS TO THE LSAR RECORD B CARD B11 BLOCK 5B. IT CONTAINS ALL ASSOCIATED COLUMNS ON THE CARD.

301.2.4.2.5A

DETECTABLE FAILURE ASSESSMENT


FROM TASK 301.2.4.2.3
HIST/ FILE
HISTORICAL DAT FILE
PREDICTIBLE IMPENDING FAILURE-AGE
FAILURE INTERVALS
301.2.4.2.
5A1
DETECTABL FAILURE ANALYSIS
TO TASK 301.2.4.2.4
NO EFFECTIV RESOLUTION
TO TASK 301.2.4.3
RCM FUNCTIONS
T/B/B11/5B/D T-RCRD B CARD# B1 BLCK 5B
AGE RELATED FAILURE
MAINT/ LN/FILE
MAINTENANCE PLAN FILE
RCM FUNCTIONS
REPLACE/ OVERHAUL CANDIDATES
SERVICE/ OVERHAUL CANDIDATES
CREW/ MONITORED CANDIDATES
FROM TASK 303.2.7
DRAFT
301.2.4.2.
5A2
REPLACE/ OVERHAUL ANALYSIS
301.2.4.2.
5A3
SERVICE/ OVERHAUL ANALYSIS
301.2.4.2.
5A4
CREW/ MONITORIN ANALYSIS
APPLICABLE EFFECTIVE REPLACE/
EFFECTIVE SERVICING/ OVERHAUL
EFFECTIVE CREW MONITORING
T/B/B11/5B/D T-RCRD B CARD# B1 BLCK 5B
T/B/B11/5B/B T-RCRD B CARD# B1 BLCK 5B
301.2.4.2.5A
Created by: STAN
Revised by: jmc
Date changed: 13-JUL-88

Name	Label	Description
301.2.4.2.5A1	DETECTABLE FAILURE ANALYSIS	REVIEW DATA ON PREDICTABLE IMPENDING AGE-RELATED FAILURES, THE CHARACTERISTICS OF FAILURE AND THEIR REQUIREMENTS INORDER TO RESTORE RELIABILITY TO ITS ORIGINAL LEVEL. SELECT THE APPROPRIATE MAINTENANCE TASK TO BE FURTHER ANALYZED FOR DETERMINING THE TASKS EFFECTIVENESS AND APPLICABILITY AS DESCRIBED IN THE AMC - P 750-2. SOURCE OF DATA: 301.2.4.2.3 (PREDICTABLE IMPENDING FAILURE-AGE RELATED).
301.2.4.2.5A2	REPLACE/ OVERHAUL ANALYSIS	DETERMINE THE APPLICABILITY AND EFFECTIVENESS CRITERIA IF A REPLACEMENT TASK IS TO BE MET. APPLICABILITY OF THE TASK DEPENDS ON THE FAILURE CHARATERISTICS OF AN ITEM. THE TASK MUST SATISFY THE REQUIREMENTS OF THE CHARACTERISTICS OF FAILURE. THE EFFECTIVENESS OF THE TASK DEPENDS ON THE FAILURE CONSEQUENCES. ECONOMIC CONSIDERATION MUST ALSO BE CONSIDERED HERE. REPLACEMENT MAY BE EFFECTIVE IF ITS COST IS LESS THAN THE COMBINED COST OF THE LOSS OF OPERATION AND THE FAILURES THAT THE TASK PREVENTS. ONCE THE FAILURE RATE HAS BEEN DETERMINED,THE COST OF PREVENTIVE TASK AGAINST THE COST OF FAILURE CAN BE ASSESSED. SOURCE OF DATA: - 301.2.4.2.5A1 (REPLACE/OVERHUAL CANDIDATES). - 301.2.7 (DRAFT REPORT).
301.2.4.2.5A3	SERVICE/ OVERHAUL ANALYSIS	DETERMINE THE EFFECTIVENESS CRITERIA OF SERVICE/OVERHAUL TASK. THIS TASK MUST BE EFFECTIVE ENOUGH TO REDUCE THE RISK OF CRITICAL FAILURE TO AN ACCEPTABLE LEVEL. *COST EFFECTIVENESS,ALSO,MUST BE CONSIDERED HERE.* COST OF SERVICE/OVERHAUL AND REDUCED SERVICE LIFE PER ITEM MUST BE LESS THAN THE COST OF REPAIR. SOURCE OF DATA: - 301.2.4.2.5A1 (SERVICE/OVERHAUL CANDIDATES).
301.2.4.2.5A4	CREW/ MONITORING ANALYSIS	DETERMINE THE EFFECTIVENESS OF CREW/MONITORING AS A MEANS OF DETECTING AN EXPERIENCED OR IMPENDING FAILURE THROUGH ROUTINE MONITORING OF THE OPERATION AND USE OF THE ITEM. EXPERIENCED OR IMPENDING FAILURES SHOULD BE DETECTED BY OPERATOR/CREW THROUGH THE HUMAN SENSES (SOUND,TOUCH,SITE,ETC.),OR INDIRECTLY,THROUGH THE INCORPORATION OF DESIGN FEATURES SUCH AS BUILT IN TEST EQUIPMENT(BITE) AND SENSOR/TRANSDUCERS (WARNING LIGHTS,GUAGES,ETC.). THE COST OF OPERATOR/CREW MONITORING MUST BE DETERMINED FOR IMPENDING AND EXPERIENCED FAILURES SO THAT A COMPARISON TO SCHEDULED AND HARD TIME CAN BE MADE. THERE SHOULD NORMALLY BE LOW COST ASSOCIATED WITH AN OPERATOR/CREW MONITOR SYSTEM. SOURCE OF DATA: - 301.2.4.2.5A1 (CREW/MONITORED CANDIDATES).

Name	Label	Description
AGE/RLTD/FAIL	AGE RELATED FAILURE	PURPOSE: DATA FOR AGE RELATED FAILURES FOR TRANSFER TO THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11. DATA READS AS FOLLOWS: 1. IDENTIFICATION NUMBER. [LCN] (BLOCK 1) 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.5 (DETECTABLE FAILURE ASSESSMENT).
CREW MONITORED CANDI	CREW/ MONITORED CANDIDATES	PURPOSE: IMFORMATION SPECIFYING : 1. THOSE IMPENDING FAILURES THAT ARE DETECTABLE THROUGH ROUTINE MONITORING OF THE OPERATION AND USE OF THE ITEM. 2. MEANS OF DETECTION (i.e., HUMAN SENSES - SOUND,TOUCH, SIGHT,ETC. OR THROUGH THE INCORPORATION OF DESIGN FEATURES SUCH AS BUILT IN TEST EQUIPMENT AND SENSOR/TRANSDUCERS - WARNING LIGHTS,GUAGES ETC.) SOURCE OF DATA: 301.2.4.2.5A1 (DETECTABLE FAILURE ANALYSIS.)
EFF/CRW/MONIT	EFFECTIVE CREW MONITORING	PURPOSE: CREW MONITORING CAPABILITY TO IDENTIFY FAILURES . TRANSFER DATA TO THE APPROPRIATE LSAR LOCATION WITHIN CARD B11. THIS DATA READS AS FOLLOWS: 1. IDENTIFICATION NUMBER. [LCN] (BLOCK 1) 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.5 (DETECTABLE FAILURE ASSESSMENT RESULTS.)
EFF/SRV/OVRHAL	EFFECTIVE SERVICING/ OVERHAUL	PURPOSE: DATA ON EFFECTIVE SERVICING AND OVERHAUL SCHEDULES. THE REQUIRED DATA IS TRANSFERRED INTO THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11. THIS DATA READS AS FOLLOWS: 1. IDENTIFICATION NUMBER. [LCN] (BLOCK 1) 2. DISPOSITION. (BLOCK 5) SOURCE OF DATA: 301.2.4.2.5 (DETECTABLE FAILURE ASSESSMENT).
FAILURE INTERVALS	FAILURE INTERVALS	PURPOSE: CONTAINS HISTORICAL DATA 1. FAILURE INTERVALS 2. FAILURE CHARACTERISTICS 3. MAINTENANCE REQUIREMENTS SOURCE OF DATA: HISTORICAL DATA FILE.
LOR RESULTS	LEVEL OF REPAIR RESULTS	PURPOSE: A DRAFT REPORT OF THE RESULTS OF THE EQUIPMENT/SYSTEM LEVEL OF REPAIR ANALYSIS AND REPORT IN ACCORDANCE WITH B409-1685. SOURCE OF DATA: 303.2.7 (PALMAN MODEL).
NO/EFF/RESLTN	NO EFFECTIVE RESOLUTION	PURPOSE: IDENTIFY THOSE COMPONENT FAILURES THAT CANNOT BE DETECTED BY: 1. INSTRUMENTS (GUAGES,WARNING LIGHTS,ETC.) 2. OPERATIONAL CHARACTERISTICS (VIBRATION,SOUND ETC.) IF FAILURE AGREES WITH ITEMS 1.& 2.,AN UNDETECTABLE FAILURE ANALYSIS MUST BE INVESTIGATED. SOURCE OF DATA: 301.2.4.2.5 (IMPENDING FAILURE DETECTION ASSESSMENT.)

Name	Label	Description
PRED/IMP/FAIL	PREDICTIBLE IMPENDING FAILURE-AGE RELATED	PURPOSE: IMFORMATION ON KNOWN INCIPIENT FAILURE INDICATORS (e.g., OPERATIONAL PERFORMANCE VARIATIONS) WHICH ARE PRECULIAR TO THE ITEM FAILURE TRENDS OVER A SPECIFIED PERIOD OF TIME (CALENDER DAYS). SOURCE OF DATA: 301.2.4.2.3 (IMPENDING FAILURE DETECTION ASSESSMENT)
RCM/FUNCT	RCM FUNCTIONS	PURPOSE: ESSENTIAL FUNCTIONS REQUIRED TO EXECUTE THE RCM MAINTENANCE PLAN. 1. FAILURE MODE,EFFECTS,AND CRITICALITY ANALYSIS (FMECA) 2. MAINTAINABILITY 3. SAFETY ANALYSIS 4. SURVIVABILITY 5. RELIABILITY SOURCE OF DATA: - 301.2.4.2.5 DETECTABLE FAILURE ASSESSMENTS.
REPLACE/OVERHAUL CAN	REPLACE/ OVERHAUL CANDIDATES	PURPOSE: INFORMATION SPECIFYING : 1. CRITICAL OR HIDDEN COMPONENTS THAT EXHIBITS WEAR OUT CHARACTERISTICS WHERE IMPENDING FAILURE CAN BE DETECTED 2. OPERATIONAL CONSEQUENCES AS BEING CRITICAL. 3. REPLACEMENT LIMITS FOR ITEMS WHERE INSPECTION/TEST OR UNIT MAINTENANCE IS NOT FEASIBLE. 4. DATA ON ITEMS HAVING AN EXTREMELY LOW PROBABILITY OF FAILURE PRIOR FAILURE. SOURCE OF DATA: 301.2.4.2.5A1 (DETECTABLE FAILURE ANALYSIS). MIL-STD-882, AR 385-55
REPLACE/OVHL	APPLICABLE & EFFECTIVE REPLACE/ OVERHAUL	PURPOSE: DATA ON THOSE COMPONENTS FOUND TO BE MORE COST EFFECTIVE TO ESTABLISH REPLACEMENT INTERVALS OR SCHEDULED OVERHAUL AFTER INDICATIONS OF WEAROUT ARE EVIDENT. THIS DATA IS TRANSFERRED TO THE APPROPRIATE LSAR BLOCK LOCATION WITHIN CARD B11 AND READS AS FOLLOWS: 1. IDENTIFICATION NUMBER [LCN] (BLOCK 1). 2. DISPOSITION (BLOCK 5). SOURCE OF DATA: 301.2.4.2.5 (DETECTABLE FAILURE ASSESSEMENT RESULTS).
SERVICE/OVERHAUL CAN	SERVICE/ OVERHAUL CANDIDATES	PURPOSE: INFORMATION SPECIFYING : 1. THOSE COMPONENTS WHICH ARE POSSIBLE TO DEFINE POTENTIAL FAILURE CONDITIONS THAT CAN BE DETECTED BY AN EXPLICIT TASK. 2. THOSE COMPONENTS THAT HAVE CONSISTENT AGE BETWEEN POTENTIAL FAILURE AND FUNCTIONAL FAILURE. 3. A LARGE PERCENTAGE OF COMPONENTS MUST SURVIVE TO A SPECIFIED AGE. 4. THE POSSIBILITY TO RESTORE ORIGINAL FAILURE RESISTANCE BY SERVICING. SOURCE OF DATA: 301.2.4.2.5A1 (DETECTABLE FAILURE ANALYSIS).

Name	Label	Description
HIST/FILE	HISTORICAL DATA FILE	CONTAINS DATA PREVIOUSLY ACQUIRED ON THE ITEM UNDER INVESTIGATION OR SOME SIMILAR SYSTEM AND MAY ADDRESS THE FOLLOWING AREAS (TO BE TREATED SEPARATELY): 1. RELIABILITY DATA 2. FAILURE RATE DATA 3. SPARES AND SPARE FUNDING DATA
MAINT/PLN/FILE	MAINTENANCE PLAN FILE	THE MAINTENANCE PLAN AS REQUIRED BY THE ILSP AND DEFINED BY: DI-S-1823 DI-L-25620C DI-R-7111 DI-A-5210 MIL-STD 470A NORMALLY PREPARED BY THE SYSTEM/EQUIPMENT DEVELOPMENT CONTRACTOR AND SUBMITTED TO THE ACQUIRING ACTIVITY AND/OR THE PROGRAM MANAGER FOR REVIEW/APPROVAL. THIS FILE ALSO CONTAINS, AS APPROPRIATE, THE OUTPUT FROM: SUBTASK 301.2.4.2.2, THE RESULTS OF THE ECONOMIC EVALUATION OF THE SCHEDULED VS UNSCHEDULED MAINTENANCE ASSESSMENTS. SUBTASK 301.2.4.2.4, THE EVALUATION OF UNDETECTABLE IMPENDING FAILURES SUBTASK 301.2.4.2.5, THE EVALUATION OF THE DETECTABLE FAILURES

Name	Label	Description
Y/B/B11/5B/B	Y-RCRD B CARD# B11 BLCK 5B COLMN B	ACRONYM: LSAR - LOGISTICS SUPPORT ANALYSIS RECORD. THIS ENTITY REFERS TO THE LSAR LOCATION RECORD B CARD B11 BLOCK 5B. IT CONTAINS ALL THE COLUMNS ASSOCIATED WITH THE CARD.
Y/B/B11/5B/D	Y-RCRD B CARD# B11 BLCK 5B COLMN D	ACRONYMS: LSAR - LOGISTICS SUPPORT ANALYSIS REPORT THIS ENTITY REFERS TO THE LSAR LOCCATION RECORD B CARD B11 BLOCK 5B. IT CONTAINS ALL THE COLUMNS ASSOCIATED WITH THE CARD.

ANNEX C:

STRUCTURED SYSTEMS ANALYSIS - FUNDAMENTALS

ANNEX C
STRUCTURED SYSTEMS ANALYSIS

Fundamentals

Structured Systems Analysis (SSA) has recently become an industry standard for generating Data Flow Diagrams (replacing "logic diagrams" or "flow charts") to aid in coordinating the functions to be performed by a computer program and its associated Inputs/Outputs (I/O). During the SSA, each set of "flow charts" can be checked by the potential user to assure that there is complete agreement on what is to be done by the program, and how it is to be accomplished. It also provides considerable flexibility for updating or changing the program.

Six basic elements are used in SSA:

1. Process (PRC)
2. Data Flow (DAF)
3. Data Store (DAS)
4. External Entity (EXT)
5. Data Flow Diagram (DFD)
6. Data Dictionary (DCT)

PROCESS (Represented by a Circle):

A function or operation to be performed which can be explained by a set of instructions representing a single task, e.g., "calculate interest on a loan", "prepare a draft report". If the Process description is too complex to describe in a few steps, it may be necessary to develop a lower level description (see below).

DATA FLOW (Lines interconnecting Processes or I/Os):

Each function or Process cannot be a stand-alone in a complex network. To have any meaning in a program, each process must be initiated by a previous action and/or provided information on which to act. Furthermore, a Process must result in an output which is the input to the next logical Process. These inputs, outputs, or initiating actions are identified as Data Flows, and are represented by the Data Flow lines indicating its point of origin and the process to which it provides data.

DATA STORE (Represented by two parallel lines):

Although some Processes generate data used as input to a succeeding Process, there is often a need to "gather or collect" information from files in which it is stored. This information may come from an external source (such as a MIL-STD, Army regulation, historical experience files, etc.), or an internal source or file in which data is temporarily stored for use by succeeding processes. These Data Stores can be visualized as a "file cabinet", in which the data are stored for later retrieval).

EXTERNAL ENTITY (Represented by a Rectangle):

Each program or logical process must have an initiating action, a "point" of disposition of the results, and possibly input guidance or instructions. Each of these have authorities, functions, or applications which are independent of the program Process (although required by the program Process). Thus, these activities, agencies, or facilities are considered "External Entities" to the program.

DATA FLOW DIAGRAM:

The general arrangement of the above can be readily seen. First, the circle or Process describes what has to be done; the interconnecting lines represent the Data Flows, together with the specific description of all I/Os. The Data Stores identify the source and/or file designation of a data base, and the External Entities represent those activities remote from the Process, which are the source of guidance or the recipients of the program. This combination of Processes, Data Flows, Data Stores, and External Entities constitutes a "Data Flow Diagram". The unique feature of the Data Flow Diagram (DFD) is that each process can be considered independently, permitting a change to be made in one Process without a major change in the overall program.

DATA DICTIONARY:

The Data Dictionary consists of a complete description of each of the basic elements. For the Process, it contains a step-by-step description of what has to be performed. The description of the Data Flow identifies the nomenclature of the data, a detailed description of its content, and its source. The Data Stores and External Entities are described, including possible location.

The Data Dictionary (a living document) begins with a description of the first Process and is continually built-up as the Data Flow Diagrams are expanded, detailed, and eventually completed.

APPROACH TO PERFORMING STRUCTURED SYSTEM ANALYSIS:

The best approach to Structured Systems Analysis is to assume that the program consists of a series of processes, each of which are to be assigned to an inexperienced analyst. Each analyst is to be walked through the assigned process of the Program, explaining step-by-step what functions have to be performed or what actions have to be taken to accomplish the process. The analyst is also informed where the information is coming from (input Data Flow), what is to be generated by each process (output Data Flow), where the data base may to be found (Data Stores), and who to contact for guidance (External Entities).

The best way to initiate a SSA is to set down the point of origin of a program, its final goal(s), and the intermediate functions or actions needed to get from beginning to goal. Each step should be considered as a Process - some may be sequential and others parallel. Then, the steps needed to accomplish the Process should be described. If the description is complex and needs intermediate steps, the Process is then a candidate for an "explosion". That is, the top (or upper) level Process is considered as a "project" and its own Data Flow Diagram is prepared.

When writing the step-by-step procedures in the Process, certain elements of data (or information) must be made available for the procedure. Each element of data is considered as an input Data Flow, which is identified and described. The product (or result) of a Process is an output Data Flow element.

Each Data Flow to the Process must originate from:

1. an earlier Process
2. a Data Store (or file)
3. an External Entity.

These sources are also identified, described and put into the Data Dictionary. As soon as the last portion of the Data Flow Diagram has been described, the SSA is complete.

GLOSSARY

GLOSSARY

AMSDL	Acquisition Management Systems and Data Requirements Control List
APJ	American Power Jet Company
AR	Army Regulation
DFD	Data Flow Diagram
DID	Data Item Description
DMEA	Damage Mode and Effects Analysis
FMEA	Failure Mode and Effects Analysis
FMECA	Failure Mode, Effects, and Criticality Analysis (FMECA)
ILS	Integrated Logistic Support
LSA	Logistic Support Analysis
LSAR	Logistic Support Analysis Report
PAM	Pamphlet
MIL-STD	Military Standard
RCM	Reliability Centered Maintenance
SSAD	Structured Systems Analysis and Design